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Rubber in Paper Making

Despite Early Setbacks, Efforts Continue to Utilize Latex or Dispersions With Paper Pulp—Many American and Foreign Processes—Rubber Paper for Power Cables

SOME half dozen years ago the filing of patents by Frederick Kaye, A.R.C.Sc., of England, on the use of latex in paper making started an unusual discussion in the rubber trade. Many enthusiastically glimpsed not only a new but very extensive use of the primary product of the plantations, for tests of the rubber paper products showed that they possessed superior properties. Latex was relatively cheap, processing simple, and even though but moderate use was made of the rubber milk with pulp, it was believed that in quantity and total value it would cut no inconsiderable figure in the world's paper industry with an annual production of some fifteen million tons.

Many, however, were not so confident of success. While hoping for the best and appreciating the fine qualities which rubber could impart to many kinds of paper, they argued that in the more efficient methods of paper making which were developing and were bound to lessen production cost, latex was not likely to prove an economical factor, as its cost was more likely to advance than recede. Advantage that might accrue from the use of dispersions was scarcely appreciated at that time. It was doubted that the benefits obtainable would be permanent, in fact, many technicians were quite sure that rubber would soon perish through oxidation.

Rosin Said to Harm Rubber

In seeking to account for deterioration of rubber in paper, Michael Levin found that abietic acid isolated from rosin and compounded in rubber and tested, after curing in a Geer oven, caused rapid degeneration of the rubber.[1] Hence he concluded that the acid derived from the rosin was the mischievous agent in latex paper. Ordinarily paper contains rosin as a sizing material, added to the pulp as a resinate of soda. When latex is also added, there are then three main ingredients—cellulose fibers, sodium resinate, and rubber. After beating and coagulating the pulp, the acid from the rosin is found with the rubber of the latex precipitated on the fibers. Rosin or resin salts have a strong affinity for oxygen, and the latter is easily passed on to the rubber.

[1] INDIA RUBBER WORLD, Nov. 1, 1926, p. 82.

In his monograph, *Latex*, published by the Rubber Growers' Association, Inc., London, 1928, Henry P. Stevens, M.A. (Oxon.), Ph.D., F.I.C., thus refers to the use of latex in paper making: "Latex was first used as a size added in the 'engine' in conjunction with rosin size. The process has not found general acceptance, no doubt partly on account of the cost of the latex. There is no doubt, however, that the use of a small proportion of latex improves the finish of the paper and also the resistance to tearing when the paper is creased. Latex has also been used in the making of waterproof boards, and there are possibilities for the use of paper impregnated with latex and other substances in the electrical industries. Latex-impregnated paper is, however, too expensive to replace the waxed paper which is used in such large quantities for the manufacture of containers."

Nearly a century before Kaye made his notable experiments, Thomas Hancock in England got British Patent No. 5,045 (1825) for the use of rubber latex in paper. His method, it appears, was to take any fibers, such as flax, hemp, cotton, or wool, place them in layers upon a smooth inclined board and then to pour or paint over such layers Hevea latex (presumably obtained from Brazil), after which the moisture was dried out at about 80° F. Inability to get an ample supply of well-preserved latex from Brazil or of castilloa latex from Mexico is said to account for Hancock's loss of interest in rubberized paper. He also got British Patent No. 5,970 (1830) for making paper by mixing latex with rags, etc., in watery pulp.

Interest then seemed to lag for a long time. It was revived by the issuance of U. S. Patent No. 69,752 (1867) for the making of paper with the rubber-like fluid found in milkweed. In U. S. Patent No. 1,007,681 (1911) Ellis describes various methods of making a paper size from rubber resins obtained in the purification of Jelutong or Pontianak gum. When mixed with a saponifiable resin, such as common rosin, and an alkali, a size is produced said to be especially resistant to the perishing influence of light. Guayule resin, it is claimed, may also be used in the same manner, but size made with it is said to be suitable only for

dark or colored paper. Another U. S. Patent No. 1,357,845 (1920) speaks of the making of paper with ground rubber-tree bark and a vulcanizing agent. Then came the Kaye patents mentioned below. Schidrowitz in U. S. Patent No. 1,502,686 (1924) proposes the use of a dispersed rubber solution with a vulcanizing agent. U. S. Patent No. 1,506,-317 (1924) to Marshall provides for the use in pulp of diluated latex to be coagulated, after beating, with alum or acid to form with the fibrous material an insoluble film.

Wide Range of Rubber Content

In U. S. Patent No. 1,567,646 (1925) Hopkinson proposes to add alkali to watery pulp, to be followed with an alkalized latex and an acid-reacting coagulant, the resulting product having a rubber content that may be varied from 1 to 150 per cent. De Cew, U. S. Patent No. 1,621,399 (1927), provides for the addition of a rubber emulsion to neutral or alkaline pulp with aluminum hydrate as a coagulant. He claims that as the rubber particles in the emulsion are positive, the coagulation yields a moisture-resistant precipitate having properties unlike and superior to those found in an emulsion coagulated with an acid salt.

A paper having a high resistance to tear is said in U. S. Patent No. 1,660,204 (1928) to be produced by first impregnating a web of paper with a rubber-containing liquid and then drying and stretching the paper. Grimm in U. S. Patent No. 1,667,854 (1928) describes a paper for backing sheet rubber as used in repairing, and to be a substitute for holland liner, made with a solution coating of silicate of soda, dextrin, and glycerol, and finally treated with a rubber solution.

Sodium Resinate with Rubber

Although Levin, quoted above, is chary about the use of sodium resinate with rubber, Rose in U. S. Patent No. 1,675,959 (1928) is evidently satisfied that it is not only efficacious but also non-injurious to rubber. He proposes the making of paper or similar sheeted material by mixing with pulp in a beater an alkaline artificial latex or dispersion of rubber in water containing sodium resinate, about 5 per cent by weight of rubber, which he says acts as a protective agent. Before the beating is finished, a dilute solution of paper-makers' alum (less than 3 per cent) is added. When the liquid in the beater becomes clear, the dispersed rubber will be found deposited on the fibers through an alteration in the electric charge on the dispersed rubber. The added percentage of rubber ranges from 20 to 50, depending on the properties sought in the product. It is said that the addition of the acidic alum agent causes the negatively-charged sodium resinate to become positively charged and to migrate toward the negatively-charged cellulose fibers and to become firmly attached thereto.

Avenson, U. S. Patent No. 1,683,597 (1928), claims that rubber latex or glue, gelatin, casein, etc., added to pulp in a paper beater will hasten the separation of the fibrous particles from the liquid, save much time, and produce a better agglomeration. Rose and Cude, U. S. Patent No. 1,705,537 (1929), describe an impregnating process in which cotton fiber is cooked with sodium carbonate solution to remove fats, oils, waxes, and other non-cellulose substances without impairing the strength of the fiber, and formed into sheets, the latter being treated with a dispersion such as rubber or a glue-glycerol composition.

Improvements on the process of Rose and Cude are described in patents granted to them and assigned to General Rubber Co., New York, N. Y., viz., U. S. Patent No. 1,756,035 (April 29, 1930,) and No. 1,773,201 (April 19, 1930).

Blombery, U. S. Patent No. 1,720,716 (1929), describes an improvement in the making of paper sheets and boards in which latex and kaolin are used as sizing and finishing materials.

Kaye's Rubber-Paper Processes

Kaye of England is generally conceded to have been the foremost experimenter in rubber or latex paper production. He got British Patent No. 167,935 (1920) in which he describes an improvement in paper making through the addition of latex to pulp. In British Patent No. 191,446 (1921) he describes an improved process. In British Patent No. 210,-193 (1922) he treats of a modification of the method whereby molded or pressed goods may be made from rubber-treated fibrous materials; and in British Patent No. 271,553 (1926) he proposes new plastic vulcanized products, as paper boards, etc.

Kaye's United States patents, covering practically all the features described in his British patents, are: 1,497,146 and 1,500,500 (1924) and 1,600,047 (1926). He had stated that he had obtained fundamental patents on his processes in twelve countries.

It has been contended by Kaye that through the use of latex a stronger, more pliable, and more durable paper can be obtained, effective percentages of rubber ranging from 1 to 5 to the weight of dried paper, the latex used being that of *H. Brasiliensis*. More resinous latices may also be serviceable for special uses, some containing even 10 per cent of coagulable material. With low rubber content, vulcanization may be dispensed with, but patents provide also for the use of vulcanizing and accelerating agents.

Other British Patents

Following Hancock, Williams in 1833 secured a patent for making paper-like materials with rubbery adhesive solutions. In 1856 Bromeley got one for making pulp cloth with such solution. In 1857 Taylor obtained one for combining fiber or wood with new or waste rubber or gutta percha. Newton in 1858 patented a process for making fibrous products in which rubber solution could be used. In 1860 McKibbin got a patent for a somewhat similar felting process. Gervaise and Bernier in 1861 proposed to make paper-like substances out of vegetable fiber with caoutchouc in solution, the sheeted material to be vulcanized with a jet of sulphureted steam.

Austin in 1862 produced sheets of paper made of fiber treated with waterproof solutions, and Snell and Reynell in 1863 patented sheets of fibrous materials made with rubber or gutta percha. David Moseley in 1864 took out a patent for similar products, using either Hancock's or Parkes' vulcanizing process. A patent was granted Danchell in 1866 for a wood-flour rubber material. In 1868 Forster patented a material of wood fiber treated with caustic potash and combined with rubber. Patents for similar materials in which binders such as rubber could be used were granted to Briggs in 1869, Hebblethwaite and Young in 1875, and to Node in 1876. Young proposed cold curing with bisulphide of carbon and chloride of sulphur. David Moseley patented in 1876 a paper containing rubber which was vulcanized with heat.

British Patent No. 253,066 (1926) and Canadian Patent No. 271,472 (1927) state that a film of liquid dope of rubber suspended in a slurry or semi-fluid mixture of colloidal clay applied to paper or paper boards will impart exceptional wearing and other qualities. British Patent No. 263,849 (1925), states that rubber, balata, or gutta percha is caused to adhere strongly to paper or similar material by adding resin in colloidal state to the latex. A solution formed from shellac, alkali, and water may, for example, be added to rubber latex with or without vulcanizing agents, fillers, dyes, glue, or other sizing material.

British Patent No. 294,412 (1927) describes a process for

treating latex with 2 to 5 per cent of soluble salts of sulphonic acids having soap-like qualities, and whereby the penetration of latex when used for impregnating paper, etc., is facilitated. Pulp, etc., may also be beneficially treated with salts such are admixed with latex. British Patent No. 294,515 (1927) provides that in making plates, molded articles, etc., up to 50 sq. cm. in area shreds or flakes of paper can be effectively mixed with an excess of binder such as a composition of rubber, etc., and allowed to stratify by gravity, drained, and pressed, with or without heating. Fillers, colors, etc., may be added.

British Patent No. 312,610 (1929) refers to a method for surfacing paper with a rubberized adhesive preparation making it attachable with pressure to untreated paper or other material. The adhesive is made by milling together plasticized plantation rubber with natural or synthetic gum or resin and zinc oxide. Wild rubber with high resin content may be used instead of plantation rubber in some cases. The solvent may be benzol or a petroleum derivative.

Dispersed Rubber

American experiments with latex in paper making have not been generally encouraging. Much of the trouble has been attributed to the condition of the latex received, very variable in quality, being often in a partly coagulated state, or containing lumps, which had to be strained out before the latex could be used. Less difficulty may now be experienced from that source. One of the suggestions made some years ago for solving such difficulty was that of Wm. Beach Pratt that the rubber be decoagulated, which has since been provided for in very efficient dispersion processes, he believing that by separating the rubber globules a uniformity could be thus obtained which would remedy most of the paper-makers' troubles.

American makers of aqueous rubber dispersions lately appear quite to have overcome the early objections to the use of such solutions, and the products are said to meet paper-makers' economic and technical requirements in a wide range of fibrous manufactures. Like latex, the dispersed rubber, crude or vulcanized, is either added to pulp or used in impregnating finished sheets.

Rubber-Paper Insulation

In the transmission of electrical power at high voltages the cables ordinarily employed consist of wire conductors heavily wound with paper impregnated with mineral oil and rosin or rosin oil alone and packed with jute in a lead casing. The rapid deterioration of such cable having given power companies in some places much anxiety, an effort was made to overcome the breaking down of the paper insulation by impregnating the paper with pure petroleum oil; but, while dielectric loss with that material was found to be low at first, it appears to have increased steadily so that it is yet feared that eventually it may prove no better than the rosin impregnation. The cause of the paper deterioration has been found to be not oxidation as at first suspected but a silent electric discharge which forms hydrogen, water, and carbon dioxide.

With oxygen eliminated as a possible factor in the reaction induced by the electric discharge, it is suggested that as a substitute for rosin or petroleum an insulating fluid composed chiefly of latex or dispersed rubber might be safely and effectively employed as an impregnating material.

It is held that while the cost might be slightly more, the probably longer life of the insulation, due to the fact that such rubber-treated paper, unlike much now used for insulation, is non-hygroscopic and, too, being safeguarded in lead from oxidation from without, and unlikely to undergo electrolytic change from within, should avert or greatly diminish dielectric loss from the conductors.

An insulating paper, according to a process of Rose and Cude, Canadian Patent No. 279,623 (1928), is prepared from a hydrated cotton fiber with rubber having a protective colloid, including an acetylated starch and a soluble silicate.

A process for making rubberized insulating paper was patented by Rose and Cude in U. S. Patent No. 1,765,774 (June 24, 1930,) and assigned to General Rubber Co.

Impermeable Parchment Paper

Andés in *Treatment of Paper,* London, 1923, states that an oil and greaseproof paper can be prepared by dipping a cotton or linen unsized paper in a hot solution of gelatine containing 2½ to 3 per cent of glycerine, drying the paper, and then immersing it in carbon disulphide containing 1 per cent of linseed oil and 4 per cent of caoutchouc in solution.

Industry and Trade

From Report of the National Industrial Conference Board

Automobile production in August in the United States and Canada, estimated at 197,030 passenger cars and trucks, declined 12 per cent under output in July to a level of 16 per cent under what it had been in August, 1930. During the first eight months of this year production reached a total of 2,059,255, a decline of 27 per cent from the corresponding period last year.

New registrations of passenger cars in the United States during July were 3.6 per cent below June and 23.6 per cent below July last year. During the first seven months passenger car registrations were 28 per cent below those in the same period last year. New truck registrations showed a slightly smaller rate of decline, 22 per cent less than last year.

Sales of American passenger cars outside of the United States during the first seven months were nearly 41 per cent below last year, and trucks were 71 per cent under the first seven months of 1930.

Stocks of new cars in the hands of dealers at the end of July were estimated to be 26 per cent lower than a year ago.

Consumption of crude rubber by manufacturers totaled 27,586 long tons, a 14 per cent decline under consumption during the previous month; an 8 per cent increase would have been seasonal.

Stocks of crude rubber on hand at the end of the month increased 2.5 per cent over stocks at the end of July; the seasonal turn is a 7 per cent decline. Stocks at the end of the month totaled 240,816 long tons.

Gasoline stocks at refineries on July 31, 1931, amounted to 38,948,000 barrels, as compared with 43,053,000 on June 30, 1931, and 46,065,000 barrels on July 31, 1930.

Machinery Not Lessening Employment

The claim that increased mechanization of industry reduces the number of jobs is met by the counter claim that, despite the considerable introduction of labor-saving devices between 1889 and 1929, the number of Americans industrially employed was actually greater per thousand of population in the latter than in the former year. Hence, it is held, our economic problems can not be referable to such a cause. Science, through engineering methods and suitable machinery, has evolved new industries faster than old ones have dispensed with human labor and has created new wants rapidly enough to more than compensate for the increased efficiency resulting in larger output per worker.

Manifold Press Vulcanizer

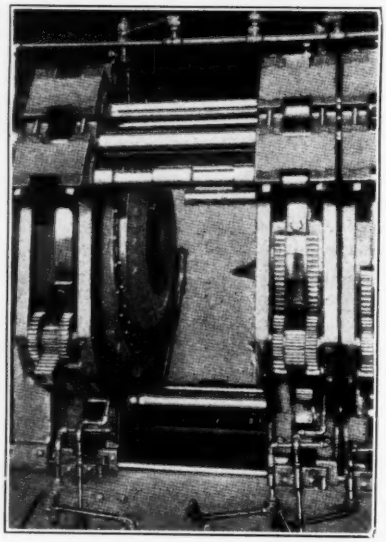
Advantages of High Production Basis, Combined With Savings of Labor, Space and Steam

P. E. Welton[1]

A NOTEWORTHY advance in curing practice has been made possible by the invention of a manifold tire press vulcanizer, a machine for continuously curing pneumatic tires. One of these machines is here illustrated.

Entirely new standards for economy in tire curing have been set by these machines since with them one man can handle the vulcanization of 20 to 80 tires, as demonstrated for the past two years in one of the leading American tire plants.

The machine which comprises 20 sections is not shut down when charging or discharging molds. While one section is being discharged, 19 sections can continue curing. The time needed for the operator to charge each mold is only 3 minutes or less, provided, of course, that tires are properly conveyed to the machine. The operator charges and discharges the tires on a regular schedule, easily holding to a 3-minute cycle and handling 20 to 30 units per hour.



Detail of the Manifold Vulcanizer

Welton Manifold Tire Press Vulcanizer

On a 1-hour cure, one man can handle 20 molds continuously, working progressively from one section to another; on a 2-hour cure, one man can handle 2, 20-mold machines; on a 3-hour cure, 60 molds; and on a 4-hour cure, 80 molds. Each of these compact 20-mold units has a maximum production of 480 to 1,400 tires per 24 hours; and the machine is so reliable that the maximum, or very close to it, is obtained under actual working conditions.

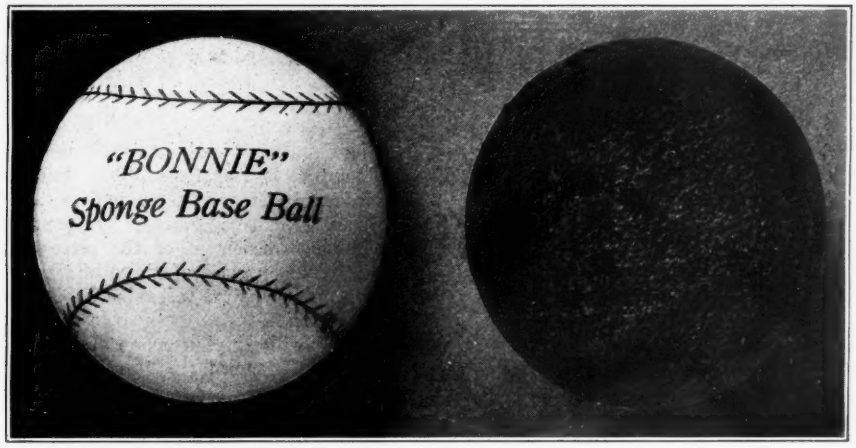
The manifold press vulcanizer takes standard molds, the backs of which are machined to a uniform thickness, and a cast-steel steam jacket welded or bolted on. A quick change from a mold of one size to another easily can be made. On the outer and inner circumference of each half-mold section interlocking lugs engage corresponding lugs in the manifold. To lock the mold or disengage it from the manifold is simply a matter of turning that particular section.

The manifold sections cannot be locked or unlocked to the push or pull rods which operate them while there is pressure in the bag to be removed. It is impossible for the operator to get away from this safety feature of the vulcanizer. Any individual mold in the series of manifolds can be opened, and the tire removed and replaced, without interference in any way with the remainder of the tires in the press.

The vulcanizer utilizes the inequality of pressures exerted by two cylinders of different diameters, to maintain a constant pressure on all the mold sections except the one released for recharging. At one end of the horizontal bed plates are the pressure cylinders, each carrying a ram providing the required hydraulic pressure to close the molds and hold them during the curing process. To open any section of the series the operator simply locks the push rods in the manifold at the other half of the section. This simple operation is performed by the use of air valves or electrical contact.

After locking the rods the operator opens the hydraulic operation valve by means of an air valve, permitting the operating cylinder to move back and engage the section on the pull rod to a point where all sections come into contact with the head and strain rods on the pressure cylinder. At this point, the operating plunger or ram which is connected by the push rods to the section to be opened forces the pressure cylinder back the necessary distance for removing and replacing the tire. When the operator closes the air valve, he opens the hydraulic operating cylinder, reducing the pressure to a point somewhat less than the total pressure in the pressure cylinder. This condition permits all molds to be held under tension until the press closs. The operation is continued with each section; the total time consumed in making the change is three minutes, or less per section. Thus continuous production is accomplished by this basically different type of vulcanizer, which will also handle the tire rimming operation.

[1] Designing and Consulting Engineer, Akron, O.



A Typical Sponge Rubber Ball

Sponge Rubber Balls

Light Unburstable Balls for Water and Indoor Play

THE first successful commercial British manufacture of sponge rubber balls is said to have begun in 1920. They were very little heavier than ordinary inflated balls of similar size and were quite as resilient. The cell formation is produced during vulcanization at the same time as the outer or finishing skin. The steps in manufacture of sponge balls are outlined in the following paragraphs quoted from a paper by a British author.[1]

The cells in sponge rubber are obtained by incorporating into a suitably softened mix substances which will evolve a fairly large volume of gas at the temperature of vulcanization. Ammonium carbonate is generally used, but excellent results may be obtained with a mixture of sodium bicarbonate and cream of tartar in molecular proportions. The latter is preferable for ball manufacture as the evolution of gas is slower and the sponging effect more easily controlled; a better and smoother outer skin is also obtained. A trace of water is sometimes added to facilitate the reaction between the sodium bicarbonate and cream of tartar, but this is not to be recommended as the quantity entering the mix is very uncertain and, furthermore, is liable to cause the evolution of carbon dioxide to commence before it is desired. Without addition of water the reaction is delayed until the compound is heated, and it then proceeds quite normally so that the addition of water is neither necessary nor desirable. In mixings where a fatty acid such as stearic has been employed as a softener, the addition of cream of tartar can be dispensed with or the quantity reduced as the acid already present in the mix will liberate carbon dioxide from the sodium bicarbonate.

Compounding

It is desirable to use a mixing containing a high proportion of new rubber. A typical example follows:

Rubber	100
Rosin oil	8
Paraffin	20
White substitute	16
Zinc oxide	5
Whiting	15
Sulphur	3
Cream of tartar	21
Sodium bicarbonate	9
Diphenlyguanidine	2

The most suitable rubber is pale crepe, because of its greater uniformity as compared with other rubbers and also because it loses its nerve more rapidly on milling. It should be well masticated between close rolls for at least 40 minutes before adding the softening or other ingredients. The total batch should not be more than about 40 to 50 pounds in weight.

After mastication of the raw rubber the other ingredients may be added in the ordinary way. The gas evolving constituents may be added at this stage or they may be left until it is desired to use the batch. It is, however, preferable to follow the practice of adding the sulphur and accelerator at the last possible moment; the accelerator being mixed into the compound from a master batch, as the slightest degree of prevulcanization is sufficient to prevent the correct amount of swelling to take place at the proper time.

Plasticity

It must be remembered that it is only the plastic ingredients in the mix that enable the gas evolved to form cells, and it follows, therefore, that the higher the proportion of minerals or other non-plastic substances present, the higher will be the weight required to make the complete ball. The volume to which the compound swells on heating is largely dependent upon the degree of plasticity attained at the time the gas is evolved as well as upon the volume of gas available. If the compound is not sufficiently plastic, it will hold the gas in small cells under pressure and swell only to a very small extent; while if, on the other hand, the compound is too plastic, it may become almost fluid and allow the gas to bubble through it so that any cells which may have been formed will collapse owing to the gas escaping. The latter condition may also have the effect of throwing the compound out to the sides of the mold, leaving an almost hollow interior. If the plasticity is correct and the volume of gas too great, a somewhat similar effect to that of too high plasticity may be observed; while if the gas volume is too low, full expansion is not obtained.

[1] "Unburstable Balls." By Ralph Defries, *Trans., Inst. Rubber Ind.*, Apr., 1931, pp. 475-86.

Gas Volume Control

The use of white substitute in the mixing quoted above is deliberately to "slow down" the sponging effect in order to increase the rigidity of the finished ball without unduly increasing its weight. This material has a very marked retarding effect, even in small quantities, where sponging is concerned, and cannot be used when light open cell sponge is required. The thermoplastic properties of a mixing containing white substitute are considerably reduced and the desired freedom of movement, as the temperature increases, is checked. The effect is not so marked with brown substitute which is sometimes used in certain classes of open cell sponge rubber. It is either incorporated as an ingredient or formed during vulcanization from oil and sulphur present in the original mix.

From the foregoing remarks it will be evident that careful control of the mixing is of great importance. Control of the volume of gas is a simple matter, and provided the materials used are checked chemically and a constant weight put into each batch very little can go wrong. Plasticity, however, is not so easily controlled as it is dependent upon more than one factor. The type and the quantity of softener have their effect, as well as the degree to which the rubber is masticated on the mill, which in turn depends upon the temperature of the rolls. It is advisable to set a definite plasticity figure to which to work, and to carry out plasticity tests on each batch.

Uniformity of the compound may be effected by blending together as many batches as are likely to be used in a single day and redivide the blended stock into batches of convenient size. Any ingredients not previously added may then be incorporated on a sheeting mill.

Molding

When sodium bicarbonate and cream of tartar, or fatty acid mixture is used for inflation, talc can be used as mold lubricant. In the case of ammonium carbonate gas is evolved very rapidly at comparatively low temperatures, and there is considerable movement of the pieces of compound in the mold, causing pockets of air to be trapped between the mold and the rubber before vulcanization begins. This condition may be obviated by lightly cold curing the surface of the compound with sulphur monochloride before placing it into the mold. The non-tacky film thus produced does not adhere to the mold and so allows any excess gas or air to escape between the mold sections.

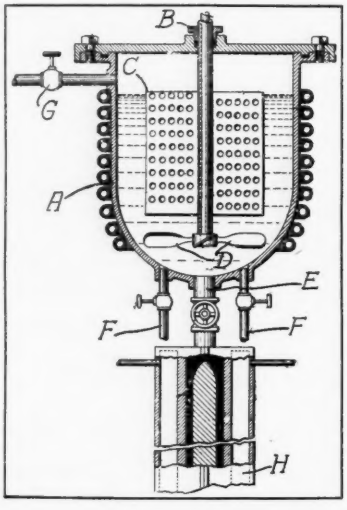
In conclusion it may be mentioned that a large variety of balls for many purposes can be made of sponge rubber, ranging from soft and light to hard and heavy with practically no bounce; and throughout the same range with exceedingly good bounce, by suitable adjusting the mix, and cure, according to the properties required.

Latex Sponge Rubber

Apparatus and Method for Making Sponge Rubber by Casting Aerated Latex in Molds

A NEWLY developed form of frothy sponge rubber for upholstery was referred to in a recent issue of this journal.[1] This material was described as being made direct from latex. The essentials of the process are that latex mixing is whipped to a froth which is poured into molds allowed to set, vulcanized, removed, and dried. This process is particularly interesting because it actually involves the element of casting, a feature distinctly new in rubber technology even though the material poured is not a fusion as in the case of casting a metal.

In connection with this method of producing sponge rubber it is interesting to note that a very late American patent[2] has been issued for making aerated rubber in that way. Although the inventor cites using "rubber heated to a liquid state," it is quite evident that the apparatus shown would work on liquid rubber such as compounded latex.



Apparatus for Molding Liquid Rubber Sponge

Mixing Vessel

Referring to the diagram, A is a covered container for the liquid rubber through which passes a hollow shaft B of an agitator or mixer carrying several perforated blades C. A propeller D is attached to the lower end of this shaft further to insure perfect mixing. When the propeller is revolved in one direction, the contents are forced upward over the blades C. When turned in the opposite direction, it tends to eject the contents of the container through the outlet E.

Pipes F admit compressed air to the lower part of the container and into the mixture being agitated. Entrance of the air is controlled by valves. A pipe inlet G located at the top of the container, serves to admit compressed air to aid in the ejection of the aerated mixture. The container is encircled by heating coils.

Mold

The container A is connected by a pipe and valve to a two-part mold H. The picture represents this to be steam jacketed and arranged for separation vertically for removal of the cast tube on its mandrel. The jacketed arrangement can be used also for circulating water to cool the vulcanized article before its removal.

Operation

Compounded liquid rubber sealed in container A is agitated by the stirring mechanism and aerated by admission of compressed air at the bottom. When aerated sufficiently the frothy mixing is ejected from the container by compressed air admitted above, aided by the reversed motion of the propeller D. The ejected mixing passes directly from the container A into the mold H, where it is vulcanized under influence of the heat applied by the steam jacket. In the finished product the cells contain air at more than atmospheric pressure, and its light spongy condition makes it particularly suited for use in heat insulation, life preservers, cushions, and for many other products.

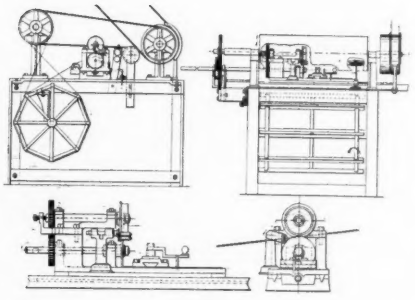
[1] "Rubber Upholstery," India Rubber World, September 1, 1931, pp. 65-67.
[2] United States Patent No. 1,818,372, Aug. 11, 1931.

Making Rubber Thread

A Survey of United States Patents Relating to the Methods of Manufacturing Rubber Thread

Joseph Rossman, Ph. D.

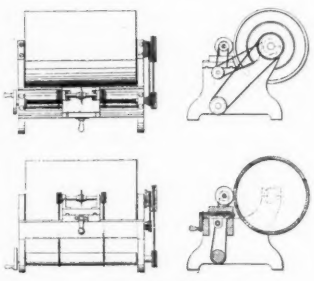
THE usual method of preparing rubber thread used for golf balls presents two major difficulties—that of cutting the thread from sheet rubber and at the same time keeping the thread in continuous length. One of the earliest United States patents, No. 16,269, December 23, 1856, cuts thread from an endless rubber belt drawn over two rotating rollers. The edges of the belt are cut by rotary knives, thus producing the rubber thread.



No. 16,269

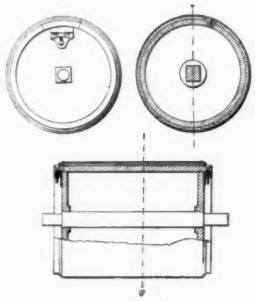
Another patent, No. 37,446, January 20, 1863, describes the use of a cylindrical rubber blank mounted on a rotating drum. A single rotary cutter is made to travel across the cylinder from end to end, thus cutting a continuous thread of rubber.

A later patent, 58,028, September 11, 1866, aims to improve the process by covering the cylindrical support with a rubber coating. The inventors state the following:



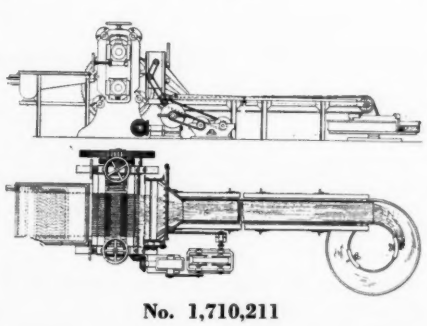
No. 37,446

"By the ordinary method of cutting rubber into threads the vulcanized sheet-rubber of any desired width and length—say, thirty to thirty-five inches wide and thirty to thirty-five yards long—is wound around a wooden cylinder from three to four feet in diameter. The cylinder is placed in a lathe and made to revolve against a circular revolving knife, which moves sidewise or longitudinally with the cylinder by means of suitable gearing to cut down through the successive sheets of rubber to the wooden surface of the cylinder. To cut the rubber, it is necessary to keep a stream of water running on the knife, which causes the wood of the cylinder to swell and make the surface uneven. On this account the knife often fails to cut the lower folds of rubber perfectly, and the surface of the cylinder is soon spoiled for the work.



No. 58,028

"This invention obviates this difficulty. It consists in employing a material for covering the cylinder to cut upon which is impervious to water, and is readily replaced without much cost, while at the same time the foundation is firm enough to bear the pressure of the knife and receive the incision through the bottom fold of the sheet cut into threads without injury to its edge. For this purpose we use, in preference to any other soft elastic material, a covering of mixed or partially-cured rubber."



No. 1,710,211

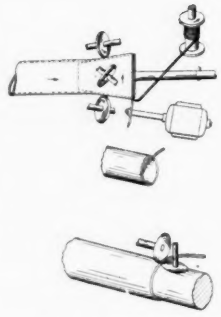
The Gammeter Process

It is surprising that until recently no important improvements have been made on the older methods of making rubber thread. The Gammeter patent, No. 1,710,211, April 23, 1929, describes a process for forming rubber thread, which consists in refrigerating a sheet of unvulcanized rubber by progression along the sheet and at the same time shearing the sheet into a number of threads. The advantages claimed for this method consist in: providing for the vulcanization of strip-rubber stock without the use of a large vulcanizing space and without resorting to elaborate procedure or apparatus for supporting it during the vulcanization; an improved manner for maintaining the cut strips in orderly arrangement in the handling thereof and during the vulcanizing period as to strips that are cut from unvulcanized stock and then vulcanized in strip form; uniformity and a desirable cross-sectional form in the vulcanized strips; the simultaneous cutting of a large number of strips from a single sheet of rubber without such distortion of the strips laterally as they are cut as to result in binding of the strips against the cutting means and non-uniformity of cross-section in the strips; regular and uniform separation of the strips at the cutting position and the application of an adhesion-preventing material to the strips before they are again brought into contact with each other.

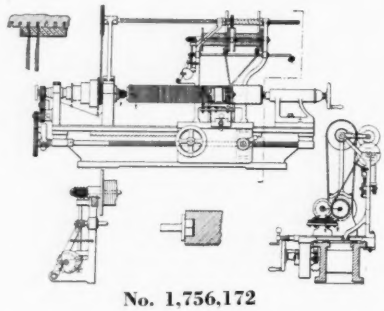
The sheet of vulcanized rubber is drawn from a suitable source of supply and by passing through a cooling chamber at about —20° F. The sheet is then threaded between a guide and presser roll and a lower set of cutter disks and into the bight of the two sets of cutter disks. The machine is then driven; which action causes the cutter disks to cut the stock into the two sets of strips; the strips of each set are sheared from those of the other set by a true shearing action, and each strip is supported on the cylindrical outer face of one of the

cutter disks in the shearing action. Because of the non-beveled form of the disks the inter-disk spaces into which the strips are forced are as wide respectively as the strips so that each strip is sheared without lateral crowding or deformation of the strip.

Each strip is forced by the cylindrical disk-face on which it rests, out of the plane of the strips of the other set; this forcing results in each strip being spaced apart from adjacent strips of the same set as well as from those of the other set, and from the positions to which the strips are thus forced the two sets of strips are led over guide rolls and between feed rolls which feed them to chutes from which they are drawn by a conveyer belt and fed into a pan which is suitably rotated, to wind the assemblage of strips upon an annular flanged receptacle; the two sets of strips are brought back into association with each other as they pass onto the conveyer belt. As the strips pass down the chutes, a mixture of French chalk and water is applied to prevent their adhesion.



No. 1,756,171



No. 1,756,172

When a desired length of the strip assemblage has been wound in the channel of the pan, the assemblage is severed, and the trailing ends of the strips are tied together and anchored. The pan with the assembly therein is then placed in a vulcanizing chamber.

The chilling and consequent stiffening of the stock avoids deformation of the stock by the cutter disks and the other feeding devices, and the true-shearing form and action of the disks permits the stiff stock to be forced without deformation into the spaces between the disks, for the shearing and spacing apart of the various rubber strips as previously described.

The procedure and apparatus are such that strips of any desired length may be obtained and the cutting may be performed simultaneously and in the same operation with the coiling or reeling of the cut strips, as distinguished from the cutting of the stock as a separate operation in the practice heretofore commonly followed in cutting golf ball thread from a sheet wound on a drum.

When the strips are cut in unvulcanized condition and subsequently vulcanized while submerged in an aqueous medium such as that described, the cut corners of the strip become somewhat rounded or dulled in the vulcanizing of the strip; this condition results in a strip less subject to breakage under tension than a strip cut after vulcanization, in which the sharply cut corners or edges have the disadvantage that defects therein initiate transverse tears in the strip under tension.

The Bommer Patents

Fred W. Bommer has recently patented several inventions for making rubber thread. His patent No. 1,756,171, April 29, 1930, consists in providing an elastic tube of rubber, applying a cutter to the periphery of the tube near its end, keeping the end of the tube at the cutter abnormally stretched and distended with relation to the distention of the rest of the tube, and simultaneously rotating the tube and feeding the distended end thereof toward a cutter to remove a continuous, helical thread therefrom.

The mandrel used is cone shaped to permit the rubber tubing to be stretched sufficiently to assure a better cutting operation. Feed rollers feed the tubing onto the revolving mandrel as fast as it is needed, the cutter thereby cutting always in the same position and groove. The width of the thread may be controlled by the speed of the feeding action, and the shape of the thread may be controlled by regulating the angle of the cutter.

Patent 1,756,172, April 29, 1930, uses a mandrel having a plurality of helical grooves. A plurality of threads can be cut simultaneously by the use of a number of circular rotatable knives which cut through the stock and into the grooves in the mandrel, thus insuring guiding of the knives and further insuring the producing of rubber threads of uniform width. The knives are adjustable relatively to the mandrel, to compensate for wear and also are adapted to move longitudinally of the mandrel during the cutting operation.

A further feature of the invention consists in means for winding the rubber threads, after they are formed, on suitable spools. This comprises friction rollers, adapted to roll directly upon the rubber threads as they are wound on their respective spools, the friction rollers being automatically adjustable as the spools are filled, these friction rollers insuring proper winding of the thread on the spools.

Uniform and level winding of the rubber threads on their respective spools is provided by means of a pair of guides for each thread, the guides being mounted on a shaft, which is cam and spring operated, by the spools in their rotation, to move the pairs of guides back and forth longitudinally of the spools and in unison, thus insuring level winding of the rubber threads on their spools, an important feature, as the threads being thus wound will subsequently feed more smoothly and evenly from the spools. (*To be continued.*)

Beating the Planting Game

IF, AS many in the rubber trade believe, there is little likelihood of the crude product bringing much more in the next half year than it does now, what course is likely to be pursued by rubber planters who are raising rubber at a loss? Obviously they can not remain "in the red" indefinitely nor continue to sell below cost in competition with natives having few wants and trifling overhead.

The planters who will survive are those who can get more rubber per acre at a cost lower than has hitherto been believed possible, which may well offset an incredibly low price range. Enterprising planters are not content with 400 to 500 pounds per acre, but aim at 1,500 pound yields with an excellent prospect of realizing their ambition and with even the possibility of 2,000 pounds per acre in the future. Science is showing the way toward more profitable results in this industry, and ways are being found for propagating high yielding rubber trees that may fairly revolutionize the industry.

Golf Ball Dynamics—II[1]

Factors Controlling the Mechanics of a Golf Ball in Play

I. T. Gurman

AIR resistance cannot be eliminated nor is it possible to be near the ball when it reaches the apex of the parabola of flight, to impart, into it additional energy as indicated in the previous hypothetical case.[2] A ball, however, may be made to behave in play virtually like a modified Goddard skyrocket without resorting to explosive material. What is more, in ordinary play, golfers actually avail themselves, not of chemical energy, but of the K.E. bound up in the rotation of the ball, to produce a whole series of further propulsions. When allowance is made for air resistance, the optimum angle of propulsion becomes somewhat less than 45° and the distance obtained is decreased in amounts depending on actual conditions of wind velocity and direction, velocity of propulsion, and the *modulus of elasticity of the ball used.*

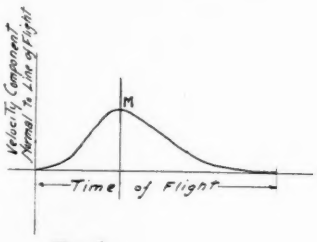


Fig. 1

As the ball leaves the club head it begins to pile up compression and suction forces in two ways: first, owing to its linear velocity, and secondly, to its speed of rotation. The former acts along the path of flight, reducing the velocity; while the latter acts to decrease the speed of rotation and produce a pressure, and a consequent velocity component, in a direction normal to the line of flight. If this force were so to function that its effect came into play only at the time the ball reached the apex of the modified parabola of flight, a condition resembling the second hypothetical case[2] would result. This condition does not occur, but instead the effect begins to function shortly after the ball starts off on its flight and continues to do so in varying degrees during the period of flight. Figure 1 gives a qualitative illustration of the manner in which this effect varies. The effect is maximum at M. The time that elapses until M is reached decreases as the speed of rotation increases.

Thus it follows, that by imparting to a ball an energy of rotation in the *proper* direction (topping it has, of course, the opposite effect) the returns in additional flight distance are favorably out of proportion with the energy expended. In other words, if a sufficient portion of the energy imparted to the ball is diverted to produce rotation as well as propulsion rather than propulsion alone, greater distance will be attained with the same amount of applied energy. In this way use is made of the presence of the atmosphere which *lessens* the distance attained through propulsion, to *increase* this distance through rotation.

The factors which govern the energy of rotation are the angle of the approach of the club head at the instant of contact (measured from the horizontal), the duration of the period of simultaneous advance of ball and club head, the mean modulus of the ball, and the moment of inertia.

As there is an optimum angle of propulsion, so there is also an optimum ratio between the energy applied to produce rotation and the total imparted energy. This turns out to be in the range between 10 and 15 per cent. Too high a proportion produces an effect similar to too steep an angle of propulsion.

The following table, computed on a basis of constant total energy equivalent to that required to propel a ball 200 yards when all the energy is applied to produce propulsion, shows the influence of various proportions of energy of rotation. Results of eight cases are tabulated.

Fig. 2

As the figures indicate, the distance gained is not proportional to the percentage K.E. of rotation. At first the gain in distance is much greater than the proportion of energy bound up in the rotation of the ball; then as this proportion increases, the gain increases less rapidly until beyond 15 per cent it begins to fall off and eventually results in loss in distance, which is to be expected. It is interesting to note the effect produced by reversing the direction of rotation. The result of a loss in distance instead of a gain is natural. The magnitude of the effect produced in Case 1 is greater than that in Case 3 although the ratio of the K.E. of rotation is the same. It is easy to picture what the result will be when a ball is topped in play, thereby producing a high ratio in the wrong direction.

Case	Per Cent K.E. of Propulsion	Per Cent K.E. of Rotation	Distance Attained In Yds.	Relative Effect Per Cent
1*	96	4	163	—18½
2	100	0	200	....
3	96	4	223	+11½
4	90	10	234	+17
5	85	15	234	+17
6	80	20	229	+14½
7	66.7	33.3	212	+ 6
8	50	50	186	— 8

* In Case 1 the direction of rotation is reversed.

Figure 2 shows the courses taken by a ball driven with the same amount of energy but under different conditions. Curve 1 represents the path taken by the ball when there is no air resistance, conditions being proper for maximum distance. Curve 2 represents the path when air resistance is allowed for and all of the imparted energy is applied to projection. Curve 3 represents the path of the ball when air resistance is allowed for and the ratio of energy of rotation is optimum. Note the change in orientation of curve 3 during the period when the ball is attaining altitude. This is so emphasized when driving "into the wind" that it becomes visible to the observer.

After the ball completes its flight, what then? There is, of course, the remote possibility that it may strike a hard surface, such as a rock, and proceed to describe a second parabola of lesser dimension. Ordinarily it lands on comparatively soft ground, striking it at a fairly steep angle, and continues to travel forward, partly by rolling and partly by sliding, for a distance that is relatively short as compared

[1]Continued from India Rubber World, September 1, 1931, pp. 56-58.
[2]India Rubber World, September 1, 1931, p. 57, last paragraph.

to the range of flight. This statement is made reservedly. It is based on the assumption that the flight is a normal one and that the fairway is level.

Two abnormal cases, because they are met with quite often, are worthy of special consideration. The first is when a ball lands on a fairway sloping downward in the direction of travel, and the second, when the drive is low. In both these cases we obtain a roll of considerable distance. The reason is the same for both cases: namely, that the angle of approach is small, and the ball instead of losing its residual energy by digging itself into the ground is propelled along the ground at a fairly rapid rate because of the planar component of its velocity of approach.

Here again, as in the case of the flight, a good paint job aids in attaining distance. On the other hand a high I_m, which adds favorably everywhere else, acts adversely on the roll, first, by reducing the speed of rotation at the beginning of the roll, and secondly, by slowing up the ball more rapidly. Residual energy of rotation also tends to slow up the ball by reducing the initial speed of rotation of the roll. The saving grace in the case of a topped ball is that in its case the reverse holds true because of the reversed direction of rotation.

It is not necessary to analyze the "approach" since it is a form of drive. The difference lies in the amount of back spin and the angle of projection, which are modified by the particular club used.

No reference has so far been made to the accuracy of construction of the ball itself. It has been assumed that the various component parts were properly assembled. Without this assumption it would be impossible to determine or discuss the general behavior of a ball in play. The accuracy of the construction determines the accuracy with which the ball will travel along its proper course during flight. Of equal importance is this property of a ball for putting purposes. The behavior of the ball on the green is governed mainly by the accuracy of its construction and the magnitude of the moment of inertia. The former regulates the accuracy with which the putted ball will adhere to its directed course; while the latter regulates its deadness, or rate of negative acceleration, on the green. The higher I_m the more rapidly will the ball come to rest. The other factors which play a part are the diameter of the ball and the design of the markings.

The value of I_m depends on the mass of the ball and the square of the radius of gyration K, which in turn is governed by the size of the center. An increase in I_m is attained by increasing the size of the center because the density of the center is greater than that of the rest of the ball, and an increase in its diameter results in a dispersion of more mass at a greater distance from the geometric center. If the specific density of the entire ball were uniform, I_m would become a function of the fifth power of the radius, and the radius of gyration would be related to the radius of the ball in accordance with the formula $K^2 = \frac{2}{5} r^2$. Because of the usual structure of the ball in which an excess of the mass is concentrated in the center, K is less than the value indicated in the above formula, its actual value depending, naturally, on the diameter on the center.

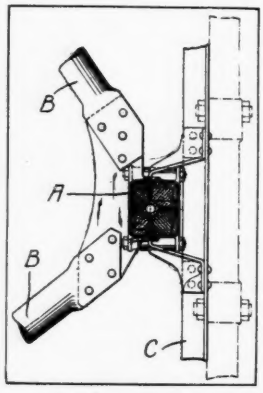
In summarizing, the writer desires to say that he has tried, both in this article and in an earlier one,[3] to emphasize the function and importance of two factors that have considerable bearing on the behavior of a golf ball in play but are not ordinarily given due consideration. These are I_m, and K.E. of rotation. Failure to consider these two factors accounts to a large extent for the uncertainty attached to golf ball behavior, to the dearth of opinion on this matter, and to the existence of contradictory views in the few cases where opinions are available.

[3] "The New Standard Golf Ball," I. T. Gurman, India Rubber World, May 1, 1931, pp. 63-64.

A third important factor, and one which should be of special interest to the manufacturer, is the value of the mean coefficient of elasticity of the ball. Special attention is directed to the fact that the atmosphere, which is usually considered detrimental to the attainment of distance in flight, can be, and is, utilized to increase the range of flight, by imparting to the ball an energy of rotation in addition to the K.E. produced by impact.

Shock Insulation Mountings

For Aircraft Engines and Radial Motors in Busses



Airplane Engine Mounting

THE extension of airplane service for passenger service has emphasized the desirability of deadening the engine vibrations and preventing their transmission to the fuselage and frame of the craft. These stresses set up by engine vibrations are extremely objectionable to the operators and passengers even if not otherwise detrimental.

An invention has recently been patented[1] to provide a rubber mounting for aircraft engines to deaden the vibrations set up by them. This type of mounting, shown herewith, is characterized by great strength and effective cushioning. At the same time it is simple in construction, readily applied and dismounted to facilitate the inspection and replacement of engines and associated parts.

The illustration represents a side elevation partly in section showing a modified mounting according to the invention. In this construction the blocks of yielding rubber A are mounted between the crank case spaced brackets B, B, and the engine mounting ring C. These brackets are generally U-shaped with their arms diverging toward the ring C. As shown in the figure, seat portions are formed on the brackets, affording bearing surfaces in every direction.

[1] U. S. Patent No. 1,815,442, July 21, 1931.

Low Inventories Cheering

A MOST encouraging feature of the business situation is the fact that factory and dealer inventories are exceptionally low. Surveys made by trade analysts reveal many impressive instances of this sort. It is stated that while inventories of 250 industrial concerns were on December 31, 1930, over 13 per cent below the previous year-end, the average decline since has reached at least 25 per cent. Hence if customer demand be even moderately stimulated, there must follow a scramble for finished goods, the supplies of which in producers' and distributers' hands were probably never lower.

Then, too, people's needs are as great as ever they have been, and there is even more money than ever in the country; only it is not coursing fast enough through the channels of trade.

If prospective purchasers could be made to realize that never again may goods be bought so cheaply as now, we would have a revival that would vie with the good old times. Already in many important fields, including staple and specialty rubber goods, buying is assuming a very confident tone, and it will steadily expand if for no other reason than that a condition exists that is the very reverse of saturation.

Philippine Planting Lags

Interest in Islands for Growing Rubber Subsides and Promotional Projects Slacken—Marking Time Until Land Laws Are Liberalized

SINCE crude rubber began to sink to its present low price range, there has been a noticeable abatement in the urge to develop rubber growing under the American flag on a large scale in the Philippines. Incidentally many promising rubber planting projects under American auspices in the island are now either dead or dormant. Yet conditions there are naturally just as advantageous as when the United States Government Commission, after making its world-wide rubber survey in 1925, reported:

"The findings indicate that the climatic conditions of the Philippines are as favorable for rubber planting as are those of the Middle East. As regards soil, topography, and accessibility, there are large areas that, if utilized for rubber production, would be superior to the lands now generally available for new plantations in Sumatra and Malaya."

Goodyear Tire & Rubber Co.

Tapping Plantation Rubber

The federal investigators were confident that ultimately a force could be mustered from among the 10,000,000 inhabitants to produce at least 70,000 tons of rubber a year. But labor is dearer in these American possessions than in those of the Dutch and British, and experienced planters doubt whether Filipino labor would be as efficient or as tractable as that in Sumatra and Malaya. In other ways, too, it is said that the insular labor market leaves much to be desired. For instance, the importation of Chinese or other coolies for clearing and cultivating plantations is strictly banned by local laws.

The 2,530-Acre Handicap

Moreover, capital, functioning best in large scale operations, is not readily attracted to rubber raising in the Philippines where laws designed to retain a diffused land ownership have limited individual or corporate holdings to a maximum of 1,024 hectares (2,530 acres). Rubber still remains but a minor product of the islands. Of four existing rubber plantations totaling 2,890 acres, it has been stated that but 600 acres were being tapped. While some large shipments are occasionally made to San Francisco, the bulk goes to Singapore. Yet a potential area of 1,500,000 acres, out of a total of 73,000,000 acres of public lands, was reported by the federal fact-finders as quite available for rubber production. Some estimate that the island of Mindanao alone with its 25,000,000 fertile acres could, if properly developed, wholly take care of American demand.

Even though the Philippine Government might demur about modifying its laws to attract capital for large rubber enterprises, it is held possible for it to encourage natives to raise rubber with other crops, as has been done by the Dutch in their Sumatra and other colonies, and even to such an extent that the total production might ultimately compare well with the amount similarly raised in the Netherlands India.

Cooperation Officially Urged

The report of the Governor-General of the Philippines issued in Washington in 1930, referring to the historic Filipino policy toward the public lands, says that the reaction in 1898 against the old Spanish régime with its land monopoly "and the consequent tyranny from which the Filipinos suffered, not only resulted in the passage of laws, under the American régime, strictly limiting the size of such land-holdings in the future, but also resulted in a general public sentiment against such large land-holdings which is one of the strongest political sentiments that the average Filipino holds today. He believes that it is better for his country to be slowly and gradually developed by a population of comparatively small individual land-owners than to be more rapidly exploited by a few large corporations which own the land in fee and till it either with tenant farmers or hired employes.

"I believe that agricultural development in the Philippines of a character which requires the coordinated productions of large tracts of land must be reached by the cooperative efforts of a large number of hacienderos or land-owners grouped about a common central which guides, fosters, and finances them under contract rather than by large holdings in fee by single corporations."

It has been proposed, as one solution of the difficulty that a system of rubber planting somewhat like that of the "colono" method of contracting for sugar crops could be easily worked out. Under it rubber companies would supply natives with seed, help supervise the growing of trees, and buy latex and dry rubber at a price agreed upon.

Still Debating Recommendations

Governor-General Wood recommended the leasing for such purpose of 50,000 acres for 25 years, but the Filipino lawmakers were unwilling to make the advised change in their

laws. His successor, Governor-General Stimson, favored setting apart an area for rubber or other crops of about 20,000 acres, the lessee operating the central section of 2,530 acres, while those agreeing to cooperate would hold a like area each. The suggestion is still under debate.

The Firestone company studied the Filipino situation exhaustively and finding too many hurdles to be surmounted turned to Liberia. A few years ago the Goodyear interests acquired a small tract in the islands, and it was then reported that they were going in for large scale cultivation; but officials say that the tract has since been used only for the study of rubber culture and plant pathology.

The Carbon Black Problem

Output of Premier Rubber Reenforcing Material Mounts as Price Declines and Consumption Increases—Production Restriction a Question

WHILE it is most unlikely that carbon black will ever become a drug on the market, the mounting stocks of that premier rubber reenforcing material and the fact that production considerably exceeds consumption, while a peculiar difficulty presents itself in attempts to check excess production, has occasioned a very unsatisfactory economic condition. Relief for the latter is seen only in the brisk, extensive revival of the rubber industry or the discovery of a new and considerable use for carbon black.

The output of carbon black for 1930 reached a new high level, 379,942,000 lbs., an increase over 1929 of 13,500,000 lbs., or 3.7 per cent. Total sales were 251,539,000 lbs., a drop from 1929 of 32,267,000, or 11 per cent; and unsold stocks reached 259,245,000 lbs., or nearly double the 1929 total.[1]

Such a condition naturally resulted in a drastic price reduction, the average value per pound at the plants in 1930 being 3.91 cents, the lowest figure ever recorded. Toward the end of the year some was sold for 3 cents. From 1925 to 1928 the annual average price ranged from 5.43 to 5.54 cents.

Distribution of Product

Domestic buyers took 167,279,000 pounds of carbon black in 1930 and 84,260,000 lbs. were exported. In the domestic field 128,572,000 lbs., or 77 per cent, went to rubber manufacturers, who also increased their percentage of demand over that of 1929. The remainder of the amount sold went to ink, paint, and miscellaneous industries.

Statistics reveal a curious fact in connection with carbon black and the rubber industry. While the total American consumption of crude rubber in 1930 was 376,000 long tons, a decline of 91,400 tons, or 20 per cent below 1929, the percentage of carbon black used in rubber manufacturing was considerably less. This is taken to indicate that the average consumption of carbon black per article must have correspondingly increased. Only a few years ago this ingredient was used in tire tread compounds in a proportion of less than 40 lbs. to 100 lbs. of rubber; now the ratio is commonly 50 lbs. and over. Many rubber chemists believe that it will soon be possible to increase the ratio with physical and economic advantages for many products.

Production Control Difficult

The control of production in order to maintain prices at a fair level above actual cost is not a simple matter. A way may yet be found to limit it voluntarily; some of the gas supply may be diverted for use as fuel, or possibly excess gas will be used as a repressuring agent in oil sands. But usually the carbon black producer is under contract to take a specified quantity of gas within a certain time from a natural gasoline producer, and the latter has similarly obligated himself to take a stated quantity of gas from the land owner. Such a tie-up may make the carbon black producer's position very difficult.

In 1930 carbon black required the burning of 266,625,000,000 cu. ft. of natural gas, a slight increase over 1929; and the yield averaged 1.43 lbs. per thousand cu. ft., compared with 1.40 lbs. in 1929. Yet the losses of the black at the plants in 1930 totaled 1,361,000 lbs., or more than double the 673,000 lbs. lost in 1929. This condition is attributed rather to increased output and lower prices than to lessened efficiency. Texas in 1930 yielded 271,749,000 lbs., or 72 per cent of the nation's total and an increase of 10 per cent over 1929. Louisiana came next with 96,729,000 lbs., a drop from the total of 127,345,000 in 1929. Montana followed in 1930 with 842,000 lbs., but one-third of its 1929 total; while Oklahoma, Utah, West Virginia, and Wyoming yielded 10,622,000 lbs., compared with the 1929 total of 8,418,000 lbs.

Rapid Rise in Favor

The rapid rise in favor of carbon black is one of the most curious developments in the rubber industry. As late as 1900 lampblack was the most important of the black pigments. Carbon black production was small, its use being practically confined to ink manufacture. But since 1900 the output of lampblack has increased from 7,500,000 lbs. to only 10,000,000 lbs. in 1930, while the output of carbon black has increased 60-fold. Lampblack was used in rubber work chiefly as a pigment for boots and shoes. Its tone is blue-black, while that of carbon black is gray-black. The tinctorial value of lampblack is much less than that of carbon black, and its reenforcing value much inferior.

It was the discovery in 1915 that the addition of carbon black to a rubber mixture greatly increased the tensile strength, resilience, and abrasive resistance of the product (as instanced alone in the raising of tire mileage from 3,500 to some 20,000) that gave the remarkable impetus to the production of this now indispensable compounding ingredient.

[1]Data from "Carbon Black for 1930," by G. R. Hopkins and H. Backus, United States Department of Commerce, Washington, D. C., July 27, 1931.

The Time to Advertise

THE business concern that would defer advertising until trade is again brisk is not planning for its advantage, as Gilbert Hodges, president of the Advertising Federation of America, recently pointed out to a notable commercial group in London. He reaffirmed a truism familiar to every well-informed student of trade that "the time for special effort through advertising is when the clouds are darkest and men's minds need to be reassured and recaptured, all of which implies a contest between the depression and the inventive genius of the world." The time to sow seeds of profitable publicity is now when rivals are resting. Great speculative campaigns begin in gloom and end in glory, and commercial trends bear a close analogy. The early birds and the far-sighted carry off the prizes.

Rubber Cutting Dies

Mallet and Machine Dies—Shapes for Rubber Footwear Parts—Ornaments for Novelties—Specification Test Pieces—Care and Repair of Cutting Dies

Webster Norris

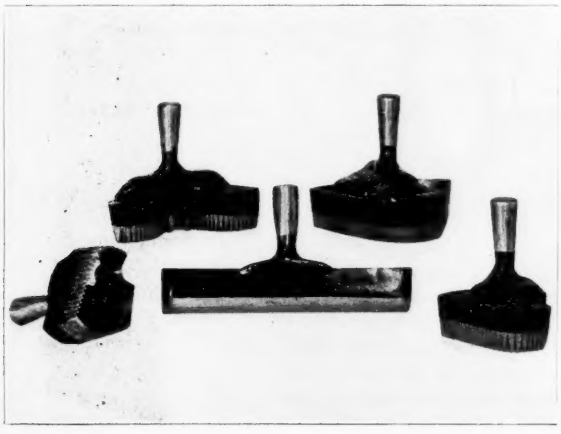
CUTTING dies are familiar tools in rubber, paper, leather, celluloid, felt, and other trades where pieces are to be produced in duplicate shapes rapidly and economically. The skill with which exact dimensions and shapes can be embodied in cutting dies is a credit to the art of the blacksmith and the tool grinder.

The die patterns illustrated here and the details of their manufacture may prove suggestive as well as informative for cutting die users.

Cutting dies are of two sorts according to construction and use: namely, the handle die and the machine die. The latter also has two forms, the clicking machine die and the Walker die.

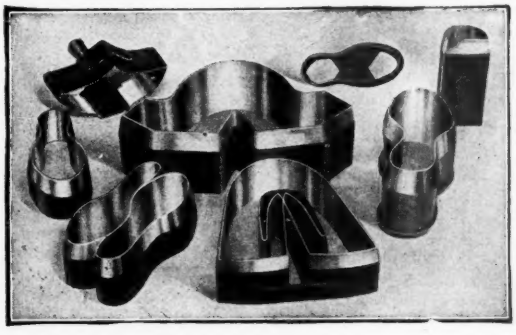
All of these forms are shown in the accompanying illustrations. Briefly described they are differentiated as follows: Handle dies, see Figure 1, have a hand grip welded to a forged bridging that spans the open space on top of the die and is brazed to it along the sides. Handle dies are generally made for cutting relatively few thicknesses of stock and pieces of comparatively small area. The handle serves to locate the die on the stock to be cut and steadies it when struck a blow by a hand mallet. A handle die operator soon becomes very swift and skilful in punching light stock with minimum waste. In the case of very small pieces girl operators wielding lightweight rawhide hammers do not find the work laborious. Handle dies are frequently used in a cutting press in the case of heavy slab stock, but that way cannot be recommended as safe practice in respect to the operator's hand.

Groups of machine dies are pictured in Figures 2 and 3. Such dies are made ¾-inch, 1¼, and 2¼ inches high according to the thickness of stock to be cut. The usual height for a clicking machine die for rubber work is 1¼ inches. Machine dies of extra cutting depth made with sides either plain or corrugated are sometimes called Walker dies. This term, however, has nothing to do with the die itself but is taken from the cutting press in which the die is used. With the advent of machine cutting a press was constructed with stroke and power sufficient to make a very deep cut. The dies for use in this press were made from 3½ to 6½ inches high although the former was the more common height of die for the Walker machine. Before the use of this press the standard height for machine dies was 2½ inches.



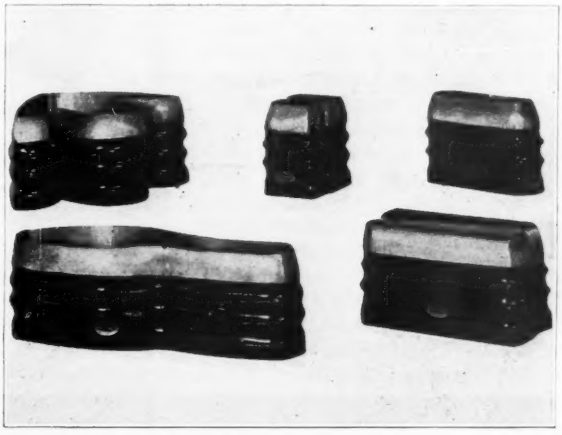
Fremont Tool & Die Co.

Fig. 1. Handle Dies for Footwear



The Hoggson & Pettis Mfg. Co.

Fig. 2. Machine Dies for Footwear

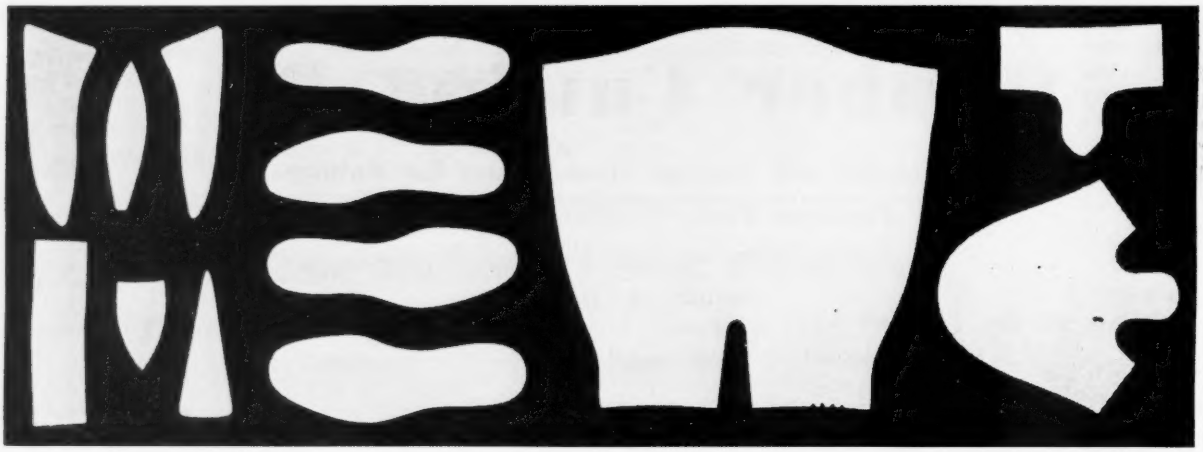


Fremont Tool & Die Co.

Fig. 3. Corrugated Walker Dies for Footwear

Making Cutting Dies

Cutting dies are hand forged from special die steel in conformity with a metal template of the

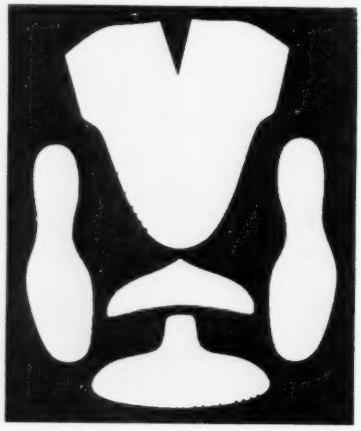


Converse Rubber Co.

Fig. 4. Short Boot Died Parts

shape to be cut. Blacksmithing skill of high order is necessary to hammer out on an anvil dies for such intricate patterns as are illustrated in this article. After the pattern is shaped from the flat steel bar its ends are united by brazing. In case a handle is to be applied it is also hand forged to span the top of the die where it is securely brazed to the sides of the die. It thus forms a stiff bridge and distributes the force applied in cutting.

The rough forged die whether with or without a handle is ready to be ground and filed on its inner faces to fit closely the outline of the original metal template. Following this the outer bevel is ground to a cutting edge and tempered. It is essential for satisfactory working of a die that its bevels be uniform in angle and depth and its cutting edges sharp, smooth, and in the same plane. The finished die under these conditions will stand in a vertical position on a plane surface, and its cutting edges will be in uniform contact with the surface of the stock, causing the die to cut squarely downward through the material.



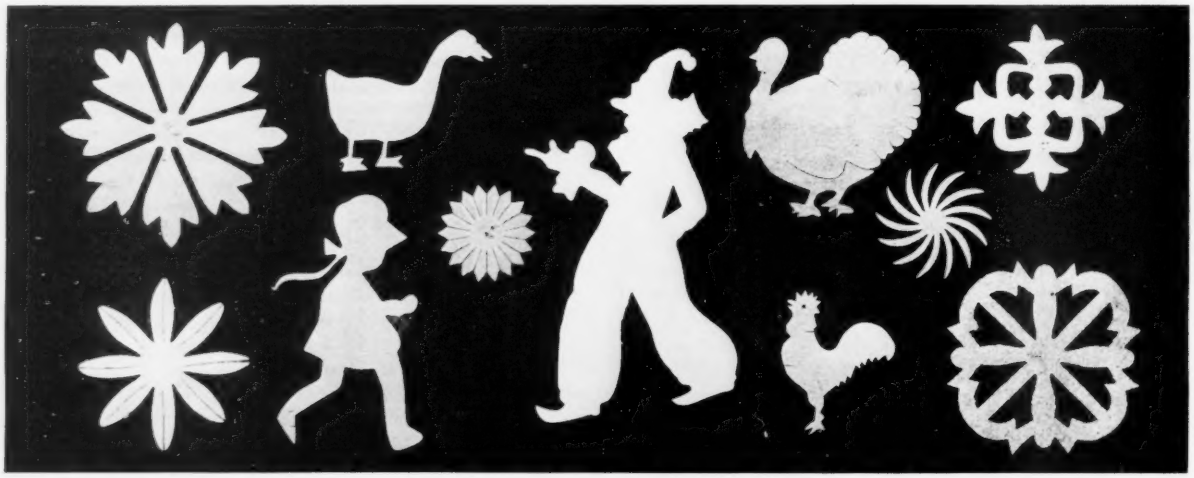
Converse Rubber Co.

Fig. 5. Rubber Shoe Died Parts

It is of interest and importance to note that broken dies can be repaired by cutting out the broken edge, brazing in a piece of steel to form a new cutting edge. A mistake often made by die users is to attempt resharpening a dull die by filing. The result is certain to be unsatisfactory because the angle of the bevel is blunted and angles of the pattern are cut back out of true with the general cutting edge. The most satisfactory method, when a cutting die is out of order, is to return it to the maker who has the tools, skill, and experience to restore it to its original working condition.

Footwear Shapes

The footwear division of the rubber industry uses cutting dies in great numbers and variety of shapes, simply because of the many and irregularly shaped pieces necessary in making boots and shoes. In such work dies are an important element of economy in the cutting equipment for reproducing rapidly the parts for assembly into shoes. In fact the complement of dies in a footwear



The Hoggson & Pettis Mfg. Co.

Fig. 6. Novelty Ornamental Died Designs

factory producing a large ticket of goods may easily number many hundreds. Thus the importance of dies in rubber work is readily appreciated when it is realized that some of the larger rubber footwear plants are equipped to make as many as 50,000 different items reckoning styles, widths, and sizes in the total.

The reader should not be misled by the statement as to the number of dies required, for most shoe parts except soles, will cut stock for several sizes and styles of footwear especially for standard internal parts.

Parts of very special shape are found in the various styles of rubber footwear. For many of these, special dies can be used advantageously if production warrants. By way of illustration, the die cut parts of men's short boots and ordinary rubbers are shown in Figures 4 and 5.

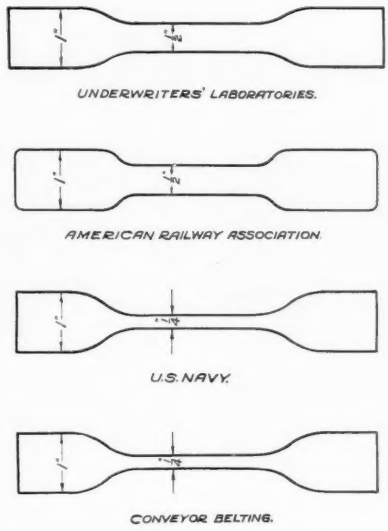


Fig. 7. Physical Test Piece Shapes

The parts of a short boot grouped in Figure 4 are as follows. On the right center is shown the leg form. Two pieces of this shape are used in a boot. Only one, however, is shown because both are identical in outline except one is slightly smaller than the other. The narrower one is for the leg lining and the wider one for the leg cover.

At the right of the leg form are the friction vamp and above that the counter form. Next on the left of the boot form are shown sole form parts. In order from top to bottom these are, toe filler, rag filler, insole, and rag sole. In construction of the boot, though, they assume a different order of placement. On the left of the sole form the stays are shown. These are, top row, a pair of side stays and between them the front stay, which in the boot is located at the top of the instep. Below at the left is the rag counter, next the heel stay, then the spike or ankle side stay.

Rubber shoe parts are grouped in Figure 5. These consist of the vamp lining, flanked on the left by the sole filler and on the right by the inner sole. Next above the vamp is the rag heel piece and above that the heel counter.

Ornamental Dies

Bathing caps, aprons, bags, and novelties of various kinds are frequently finished with some ornamental feature in rubber. Several fancy shapes used by rubber companies for this purpose are exhibited in Figure 6. These outlines are fair samples of the complicated shapes, hand forged, by die blacksmiths. In this connection attention is directed to the following points concerning the individual shapes in Figure 6:

The conventional flower in the upper left corner has many sharp angles, and much bending was required to give the symmetrical form. Bending the steel to outline the feet of the goose is intricate, fine work. The same remark applies to the feet of the turkey. Note also the large knife cut just above the feet to outline that bird's wing.

The design in the upper right corner requires four inside dies attached within the outer die.

The floral shape in the lower left corner shows a knife cut lengthwise of each of the 8 petals. These are set radially and are a part of the die.

The difficult feature of the figure representing a child running is the flowing narrow hair ribbon.

The seal-like die between the child and the clown contains eighteen knife blades radiating from the center to the notched circumference. One arm of the clown is defined by an inside die and the entire outline of the figure is particularly irregular and difficult to form.

The closeness of the comb and tail feathers of the rooster is notable.

The cutting edges of the die for the spiral figure are very closely and evenly spaced.

The design in the lower right corner contains a group of eight inside dies grouped centrally within the die for the outer shape.

Rubber Test Piece Dies

In American practice dumb-bell shaped test pieces are commonly used for determining the tensile properties of cured rubber. These are cut to specific dimensions quickly and accurately by handle cutting dies. The sizes and shapes of such test pieces vary according to specifications. Several standard test piece die shapes are shown in Figure 7, and their official origin is designated.

It is advisable that a testing laboratory be supplied with duplicate dies for such test pieces as they regularly use. This permits sending dull or broken dies to the die maker for reconditioning. A sharp test piece die is the first condition for accurate physical testing. It is well to remember that a perfect cutting edge cannot be restored by file in the hands of an amateur; only a die maker can properly recondition any die for the reason that brazing and regrinding require skill and facilities for good work.

The New Golf Ball

THE situation regarding the manufacturers of golf balls who are confronted with making a change on April 15, 1932, in the weight from 1.55 to 1.62 is the disposal of stock on hand of the present ball 1.68 by 1.55. These recurring changes in the ball as determined by the United States Golf Association has the effect if not the intention of shaking out of the industry the small concerns who have made some inroads in the business of the large manufacturers in the last few years. The increased cost of making the ball heavier is negligible as it involves only the addition of filler to the pill on which the thread is wound.

The present season has witnessed a flooding of the markets with cheaply made and cheaply sold golf balls, undistinguishable from the outside to the buyer from good balls, but quickly proved delinquent in play. The shelves of dealers throughout the country are flooded with these cheap balls, which are unmovable at any price, hence the recent realization by some makers that quality that will beget resale is the only way to establish a sound business in this line.

The most important feature in golf ball construction is properly winding the core. Perfect winding with Para thread, stretched 1 to 8, without breaks or chafes will produce great speed and distance, provided the cover is not too thick and of high grade materials.

Banbury Mixer Efficiency on

Manhattan Rubber Mfg. Co.

Fig. 1. General View of Banbury Installation

THIS study compares the efficiency and the economy of Banbury with roll mixers in the preparation of stocks for a great variety of mechanical rubber goods.[1] The equipments compared were two No. 9 Banbury mixers and three 60-inch mills against twelve 60-inch mills on the same lines of stock.

The principal features of the installation studied are shown in the illustrations. Figure 1 is a general view showing conveyers bringing pans of rubber and compounding ingredients from the compounding room. Also at the right appears the short slat conveyer for delivering mixed stock from the Banbury to the 84-inch mill for sheeting the batch.

Figure 2 shows the automatic loading mechanism for dumping pans of ingredients into the Banbury. The conveyer is shown delivering a box of rubber for a batch.

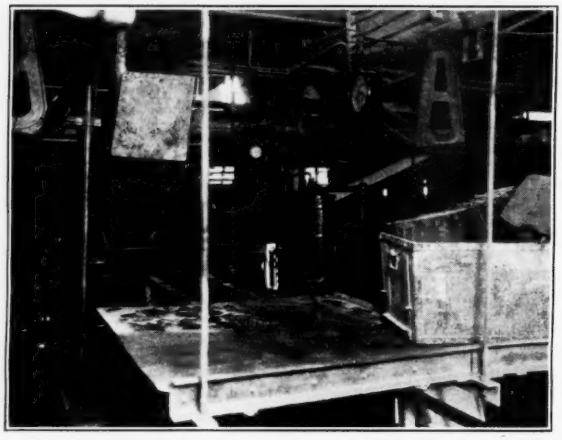
Sheeting mills and conveyers are pictured in Figures 3 and 4. In the first of these views is seen the conveyer from below the Banbury to its 84-inch sheeting mill, and to the right a long wide belt conveyer that carries sheeted batches to storage on the floor above.

Figure 4 shows the 84-inch mill from the opposite side of Figure 3. The conveyer to the upper floor is provided with slats to keep the stock from slipping on the conveyer.

Operating Methods

The Banburys worked on a 144-hour schedule each week —five 9.6-hour days for both and four 12-hour night shifts for one of them. The department averaged 50 weeks of work a year on this basis. Weighing for both Banburys was handled by two men on the day shift, one on rubber and one on powders. At night the work was handled by two men working half-time on each line. The total weighing labor was thus 144 man-hours a week. Boxes of rubber and powders met at the mixer as outlined above. The mixer operator stood on a platform at the mouth of the feed hopper where the automatic timer and the air control on the door were convenient to him. Boxes were dumped into the hopper mechanically, and the operator pushed them out by hand onto the return conveyer. The handling of operating instructions was the same during this period as at present. Each formula coming to the operator now has an instruction card which outlines in detail the procedure to be followed. When all the batches for that formula are run, the operator returns this card to the check scale weigher. The recording thermometer makes a permanent chart of the procedure on each batch and offers a sure means of avoiding or quickly settling complaints directed at the mixing department.

Batches run fairly constant in volume but vary widely in weight, according to the different formulæ. The amount, number, and nature of fillers to be compounded with the rubber regulate the time of mixing. Times vary from 3 to 12 minutes, with an average between 6 and 8 minutes for batches running 1.5 in specific gravity and weighing about 367 pounds each. Such a batch contains rubber of about .92



Manhattan Rubber Mfg. Co.

Fig. 2. Banbury Loading Mechanism

specific gravity, has no coarse fibers which require thorough distribution; and is not highly loaded with pigment. Indicated temperatures in the mixing chamber sometimes reach an upper limit of 212° F., but average considerably less. Sulphur is added to the batch in the Banbury's just before discharging in nearly all cases. Changing from one color or formula to another is handled on the Banburys as on roll mills. The method of working down the scale in rubber content and color is practiced whenever possible.

Three of the original 60-inch roll mills were retained for a small volume of special work after the Banbury equipment went in, and these machines continue in use at the present time. Their job consists chiefly of handling special orders or standard runs under 300 pounds. During the period here under discussion, these machines operated five 9.6-hour day shifts and four 12-hour night shifts each week, making a total of 96 hours per machine. One man was used on each mill. Weighing was handled by two men on each shift; this work required about 75 per cent of their time, 144 man-hours a week, and the remainder was chargeable elsewhere.

Production from the two Banbury mixers was 462,000 pounds per week under average conditions on their 144-hour operating schedule, or an average rate of approximately 3,200 pounds per machine-hour. The machines are capable of higher production than this, however, and hourly outputs of 5,000 pounds have been recorded on some occasions, equivalent to 720,000 pounds per 144-hour week. This entire

[1]Survey by A. C. Nielson Co., Chicago and New York.

cyon Mechanical Stocks

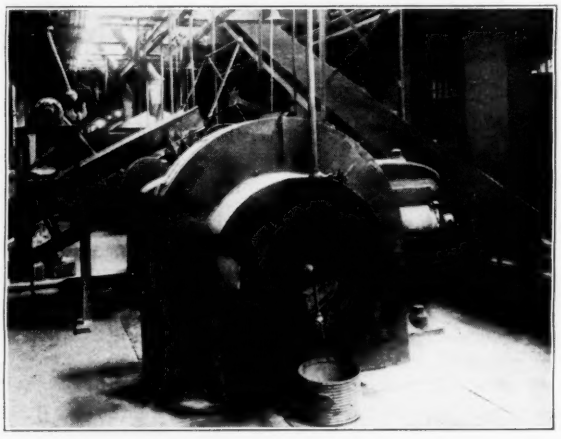
production from the Banburys went also through the 84-inch sheeting-out mills. The three 60-inch roll mills retained for small-lot runs averaged 5,000 pounds per mill per shift and, working 5 day and 4 night shifts each or 27 shifts per week, handled altogether a total of 135,000 pounds. The average rate was thus 470 pounds per machine hour.

Power requirements of the Banburys were determined by means of a 30-day test covering production on all classes of stock. The 30-day average input to the Banbury's proper, including feeders, was 4.4 kw.-hr. per 100 pounds. Several individual tests revealed the average input to 84-inch roll mill as .8 kw.-hr. per 100 pounds. The total for mixing and sheeting is 5.2 kw.-hr.

Banbury Advantages

Power requirements have been reduced from 9.3 to 6.1 kw.-hr. per cwt. of rubber produced. The gain is 34.1 per cent. Floor space now totals 4,800 square feet instead of 6,400 as formerly On the unit basis this represents a cut from 11.85 square feet per thousand pounds of output per week to 8.04 square feet. The reduction here is 32.1 per cent. Lastly, operating labor requirements have been cut 56.2 per cent, and compounding costs 77.4 per cent.

Other and even more important advantages have been gained in the form of improved quality. Output from the Banbury mixers is no better than the best which can be had from roll mills, but it is much more uniform. Every batch



Manhattan Rubber Mfg. Co.

Fig. 3. Conveyers from Banbury to Sheeter and from Sheeter to Stock Above

of rubber is tested in the laboratory, and these tests show that the Banbury rubber is far superior in this respect. This condition is as might be expected in view of careful timing and temperature control on mixer batches. Any error in either of the important constants for any formula can be checked immediately and traced directly to its source. Laboratory tests formerly showed up such errors on the mills just as clearly and promptly, but tracing and fixing responsibility for the variation was difficult. It was frequently necessary to continue running on a basis known to be faulty while efforts were made to locate the source of trouble. This practice was obviously wasteful of both time and materials.

Another important advantage of Banbury mixer equipment is its reduction of operating hazards. The risk of serious injuries is eliminated entirely and operators for Banbury equipment are much easier to get than operators capable of producing satisfactorily on roll mills. This condition reflects directly in the labor rates of 80 cents per hour for roll mill men as compared with 75 cents per hour for men on the Banbury mixers. The management states that this department normally get 85 to 90 per cent efficiency on the first day's work of a new Banbury operator and claims it takes at least a year to break in a roll mill man. The operation of a roll mill for mixing is more properly classed as a craft than a production job. The use of Banbury mixers breaks the spell and almost entirely eliminates the variable human element from the extremely important operation of mixing.

Summary

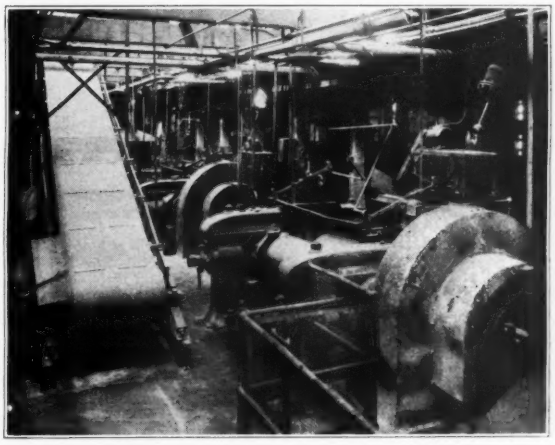
In the rubber plant surveyed all large batch mixing is handled in two No. 9 Banburys and two 84-inch roll mills for sheeting the batches. In addition three 60-inch mills are used for small orders. All equipment is in regular use on 72- and 96-hour weekly schedule. Output averages 597,000 pounds per week.

Equivalent work was originally done on twelve 60-inch roll mills. Output then averaged 540,000 pounds a week. Comparison shows following unit costs and savings per 100 pounds.

Comparison of Economy

		Present			
		2 Banburys, 2 84-In. Mills		2 Banburys, 2 Mills, 3 60-In. Mills	
	Former 12 60-In. Mills Cost	Cost	Saving Per Cent	Cost	Saving Per Cent
Fixed charges	$.1017	$.0657	35.4	$.0772	24.1
Compound boxes	.0052	.0009	82.7	.0009	82.7
Power	.1395	.0780	44.1	.0919	34.1
Operators	.1706	.0468	72.6	.0748	56.2
Compounders	.1323	.0193	85.4	.0299	77.4
	$.5493	$.2107	61.6	$.2747	50.0

Net savings are at rate of $1,639.36 a week or $81,968.00 a year, paying 66.4 per cent return on investment in new equipment.



Manhattan Rubber Mfg. Co.

Fig. 4. Sheeting Mill and Conveyers

EDITORIALS

Forty-two Years Old

THE passing of another milestone, the 42nd, of INDIA RUBBER WORLD, commemorated in this edition, might well stir many pleasant reveries for those who have had the pleasure to direct its long and successful course. Since it made its début in October, 1889, they have had occasion to chronicle a development in the rubber industry unsurpassed by any other, and a service rendered by that industry of incalculable benefit to the world. In achieving its leadership they have been aided with counsel, observations, and information by the ablest specialists in the broad field of rubber activity. For such valuable cooperation and for the generous support and appreciation of a host of subscribers and advertisers this journal is deeply grateful, and in requital for such encouragement it earnestly pledges to make this publication in all the years to come more interesting and more helpful than ever to everyone in the rubber industry the world over.

Industrial Stabilization Plan

TYPICALLY American is the plan proposed by Gerard Swope, president of the General Electric Co., Schenectady, N. Y., for giving industry a new constitution under which production and consumption and employment may be so well steadied and coordinated that lasting relief may be had from "hard times." It is a broad, comprehensive scheme contemplating the lifting of the administration of industry from a narrow separate sphere wherein each unit is virtually a law unto itself to a broad, universal basis, which could combat depression not through state coercion but through freedom of action, permitting economic stabilization of unhampered industry and regularity of employment for workers freed of the fear of idleness, of illness, and of old age.

An outstanding feature would be a trade association for each industry which would exercise control of production. The practices devised and administered by it would be submitted to a federal supervisory board to which the public would have full recourse and which would pass upon the soundness of such practices. For employes' protection, companies must provide for workmen's compensation, pensions, life, disability, and unemployment insurance, and agree that there will be no forfeiture of benefits if an employe transfers from one company or industrial branch to another, the latter provision thus eliminating the penalty hitherto often imposed because of advancing years. Joint contributions to and mutual management of pension and insurance funds by employers and employes would be mandatory.

The financing of the plan would be brought about by adding its cost to the cost of the articles or service rendered by each industry. There would be no occasion to resort to any tax for workers' relief, much less the establishment of the dole or other debasing device suggestive either of a slavish laboring class or a paternalistic form of industrial rule. New legislation, of course and the changing of some old laws may be needed, but this change is not regarded as difficult, especially since the plan is so obviously fair and practicable.

It is a remarkable plan that but a few years ago would have been regarded as downright socialism but is now considered as little else than enlightened altruism and good business. In fact, as its noted proponent says: "Industry has now come to the point where it must take some such step to forestall legislation threatening the fundamental structure of American business and the cherished ideals of American society."

Curbing Cost of Governing

A PROBLEM worthy of earnest consideration by rubber and all other manufacturers is that of halting a serious menace to industry, the high and growing cost of government. While the business community is ever striving to conduct its affairs more economically and efficiently, its endeavors are largely offset by the forces that sway government and that are scheming unceasingly to waste the public substance that can only be supplied through taxation. Even though executive officers may oppose the raiding of city, county, state, and national treasuries, they usually find themselves powerless against elective bodies that are easily swayed by aggressive small groups seeking all sorts of unearned advantage over the usually too lax majority.

Not on'y has the ordinary cost of government grown unreasonably high, but under the pretexts of progress, humanity, farm relief, etc., a host of new evils is being perpetrated on taxpayers through huge bond issues draped like so many millstones about the necks of taxpayers. But, it may be asked, how is this mounting toll to be checked? The answer is that voters should vigorously assert themselves against minority rule and extravagance, and that industrial leaders who can accomplish much concertedly should oppose candidates who do not pledge themselves to limit more closely the functions of government and appropriations for its administration. Business now pays taxes out of all proportion to benefits received, and should resolutely set its face against political prodigality.

POOR TIRES ARE LIKE POLITICAL HACKS. BOTH FULL of wind, they get booted and punctured, skid a lot, perform less than they promise, are noisy in running, and both throw much mud.

What the Rubber Chemists Are Doing

Value of Rubber Hydrocarbon in Reclaimed Rubber[1]

C. W. Sanderson[2]

THE investigation reported in this article is concerned with the evaluation of the rubber hydrocarbon of reclaimed rubber as measured by resistance to road wear in a tire tread stock. The work is a confirmation by road tests of that reported by Vogt[3] under this same subject and is similar to previous work by the author.[4] The method of constant composition as used by Vogt was employed in this work. The series, however, was carried from 0 to 100 per cent reclaimed rubber hydrocarbon instead of from 0 to 60 per cent as in Vogt's work.

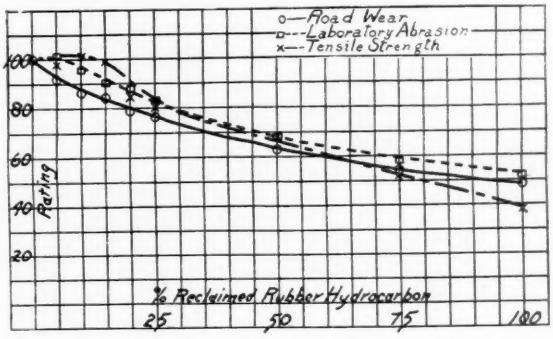


Fig. 1. Evaluation of Reclaimed Rubber Hydrocarbon

Experimental Tests

The reclaim used was whole-tire alkali reclaim, and in order to get an average material the lot used was prepared by selecting daily samples over a period of about 3 months and then blended. Mixed with 5 per cent sulphur and cured 17 minutes at 141.5° C. it gave:

Tensile strength	55 kg. per sq. cm.
Elongation	437 %

The chemical analysis of the reclaim was as follows:

	Per Cent
Sp. gr.	1.155
Moisture	0.46
Alkalinity (4 hrs.)	0.008
Alkalinity (48 hrs.)	0.007
Acetone extract	7.12
Chloroform extract	28.24
Alcoholic potash extract	1.08
Free sulphur	0.07
Combined sulphur	2.47
Free carbon	11.18
Ash	18.55

The analysis of ash was:

	Per Cent
Silica	2.42
Iron and aluminum oxide	2.60
Calcium oxide	1.37
Magnesium oxide	1.10
Zinc oxide	9.00
Sulphate (SO_3)	1.21

From this analysis the following was derived to duplicate the composition of the reclaim:

	Per Cent
Rubber	55.00
Mineral rubber	6.10
Pine tar	6.10
Carbon black	11.00
Zinc oxide	9.00
Clay	6.50
Whiting	4.10
Sulphur	2.20

The insolubles were assumed as clay, and the balance of the minerals, minus the zinc oxide, as whiting. The acetone extract was increased by 50 per cent to allow for the part of mineral rubber not extracted and was assumed to be 50 per cent mineral rubber and 50 per cent pine tar.

The starting point for the series of stocks used was the 100 per cent reclaim compound. It was derived by adding as much carbon-black loading as the stock would stand and still be capable of processing in the factory. No zinc oxide was used in this compound, as it had been found by previous work that its presence in such a compound adds neither to the physical tests nor to the road performance. The composition of this stock (9 in Table 1), taking into consideration the ingredients in the reclaim with the exception of the sulphur, was then used to compound the series as given in Table 1. Three and a half per cent of sulphur, 4.0 per cent of stearic acid, and 0.75 per cent of Captax based on the rubber hydrocarbon were constant in the series, and the activating effect of the reclaim was adjusted for by using litharge in the low reclaim stocks. The black was added as a 60-40 master batch with rubber and as a 75-25 master batch with reclaim. The stocks were judged to have a uniform optimum technical cure at 60 minutes at 126.4° C.

Physical Tests

Standard methods of testing, as recommended by the Physical Testing Committee, were used except as noted. The tests were made on samples taken from tubed treads.

TENSILE STRENGTH. The tensile tests were made with the Goodyear autographic machine. Table 2 shows the tensile,

TABLE 2. RESULTS OF TENSILE TESTS

Reclaimed Rubber Hydrocarbon %	Tensile Strength Kg./sq. cm.	Elongation %	Load At 300% Kg./sq. cm.	Load At 500% Kg./sq. cm.
0	226	590	75	178
5	222	580	80	180
10	230	560	80	178
15	225	565	80	174
20	190	520	88	170
25	180	515	82	...
50	150	470	88	...
75	118	485	78	...
100	84	325	78	...

TABLE 1. COMPOSITION OF SERIES

Stock	1	2	3	4	5	6	7	8	9
Rubber	100	95.0	90.0	85.0	80.0	75.0	50.0	25.0	0
Reclaim	0	9.1	18.2	27.3	36.4	45.5	91.0	136.5	182.0
Carbon black	49.2	48.2	47.2	46.2	45.2	44.2	39.2	34.2	29.2
Zinc oxide	16.38	15.56	14.74	13.92	13.10	12.29	8.19	4.10	0
Clay	11.56	10.98	10.40	9.83	9.25	8.67	5.78	2.89	0
Whiting	7.46	7.09	6.71	6.34	5.97	5.60	3.73	1.87	0
Mineral rubber	10.50	9.98	9.45	8.93	8.40	7.88	5.25	2.63	0
Pine tar	10.50	9.98	9.45	8.93	8.40	7.88	5.25	2.63	0
Litharge	0.60	0.40	0.20	0.10	0.10	0.10	0	0	0
Sulphur	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Stearic acid	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Captax	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total	214.45	214.54	214.60	214.80	215.07	215.37	216.65	218.07	219.45

[1] *Ind. Eng. Chem.*, Sept., 1931, pp. 989-91.
[2] Goodyear Tire & Rubber Co., Akron, O.
[3] Vogt, *Ind. Eng. Chem.*, 20, 140 (1928).
[4] Sanderson, INDIA RUBBER WORLD, 80, 453 (1929).

elongation, and moduli (load at 300 per cent and 500 per cent elongation).

The relative values (non-reclaim stock, 100) are shown on Figure 1. The noteworthy fact is that the tensile properties do not fall off until over 15 per cent reclaimed rubber hydrocarbon is reached, this is in direct contrast to road results.

ABRASION. Laboratory abrasion tests were carried out by two methods: the Goodyear, called method A by Vogt[3], and the du Pont abrader. The results are shown in Table 3.

TABLE 3. RESULTS OF ABRASION TESTS

Reclaimed Rubber Hydrocarbon %	Loss by Goodyear Cc.	du Pont Cc./hp.-hr.
0	19.5	402
5	19.3	377
10	20.3	359
15	21.7	456
20	22	481
25	23.9	413
50	28.8	562
75	34.4	685
100	37.1	856

The Goodyear abrasion results (relative) are shown on Figure 1. They check fairly well with the road tests except that here again the results on the 0 to 25 reclaimed rubber hydrocarbon are too high. The du Pont abrader results between 0 and 25 are very erratic and, therefore, are not plotted.

Road Test

The stocks were run on a tubing machine and built into two-way treads for 4.50-21 tires. The comparisons were made as follows: 1 vs. 2, 2 vs. 3, 3vs. 4, 4 vs. 5, 5 vs. 6, 6 vs. 7, 7 vs. 8, 8 vs. 9, also 1 vs. 4, 4 vs. 6, and 6 vs. 8. The tires were run in general service; the majority were on Ford cars. The tests were run over a period extending from March to December, 1930. The rating was determined by design height measurements on an average of eight tires per test.

TABLE 4. RESULTS OF ROAD TEST

Reclaimed Rubber Hydrocarbon %	Rating	Secondary Rating
0	100	100
5	92	
10	87	
15	86	86
20	81	
25	79	78
50	65	
75	56	57
100	50	

The results are quite consistent and the secondary comparison checks the main series. The results are shown graphically on Figure 1.

Discussion of Results

Using the method of Vogt[3] for interpreting the results,

Let A = value of abrasion resistance of new rubber hydrocarbon with assigned value of 100 units.
B = value of reclaim hydrocarbon in same units.
C = experimentally determined values for abrasion resistance (based on new rubber stock = 100) of various stocks.
Y = amount of new rubber hydrocarbon as decimal fraction.
$1.00\ Y$ = amount of reclaim hydrocarbon as decimal fraction. Then $AY + B\ (1.00 - Y) = C$, on assumption that qualities of two types of hydrocarbon are additive.

Solving $$B = \frac{C - AY}{1.00 - Y}$$

Using the road values, Table 5 is obtained.

TABLE 5. VALUES OF RECLAIMED HYDROCARBON

Reclaim Hydrocarbon %	B Value
0	...
5	Neg.
10	Neg.
15	7
20	4
25	16
50	30
75	41
100	50

These results check very well with Vogt's[3] conclusion: namely, "The value of the reclaimed rubber hydrocarbon varies from 0 when substituted in small percentages, up to a maximum of 50 per cent of the value of new rubber when compounded in large percentages." There is a close similarity between these results and those obtained in the previous work by the author, even though in that series the composition was not constant.

The relative road abrasion value of the rubber hydrocarbon in the reclaim having been shown, the next question is, what does this value mean when used in practical tread compounding? Bierer and Davis[5], while perfectly clear on the fact that the rubber hydrocarbon from reclaim is inferior to new hydrocarbon, attempted to show that this could be overcome or compensated for, when substituting reclaim for rubber, by taking diluents or excess filler from the rubber stock and by adding reenforcing material to the reclaim stock. They failed to realize that the same measures which would improve the reclaim tread could be applied to the base stock.

If it were true that, because of the plasticizing effect of the reclaim, it would be possible to carry higher black loading in the reclaim tread stock with the same ease of handling, there would be some weight to the argument that the reclaim can be compensated for by adding black. Factory practice does not show this to be the case. On the contrary, the added black must be considerably reduced to keep the same handling conditions. If it were possible to process the reclaim stock with higher black, then it would also be possible to add more black to the non-reclaim stock and keep the differential in road wear. Since this is the case, if the non-reclaim tread stocks is taken with no diluent or excess zinc oxide and with as much black loading as can be processed, then it is not possible to make compensation for the effect of the reclaim. These facts were put forth very clearly by Cranor[6], who states that "A better tread can be made without reclaim than can possibly be made with it."

The series in the present paper was not designed primarily to show the extent to which wear will fall off with the use of reclaim in a series of practical tread stocks. However, since no compensation for its effect is possible, the wear in such a series would fall off even faster than in the series in this paper, for in the latter diluent materials were added to the non-reclaim stock. It can be said, therefore, that up to 20 per cent the use of reclaim will cut down the resistance to road wear by approximately the percentage used. This is essentially the conclusion reached by Holt and Wormeley[7]. Their method was severely criticized by Bierer and Davis, but considering that their base stock was as stiff and tough as was considered practical at the time, this criticism was not justified and their conclusions were essentially in line with the facts.

Some Properties of Carbon Black

I—Adsorption[1]

W. B. Wiegand and J. W. Snyder[2]

Summary

THE diphenylguanidine (DPG) adsorption test correlates well (0.8) with rubber-curing behavior in organically accelerated mixings, in respect to the broad classes of carbon black, but only moderately (0.4) in respect to standard rubber carbon black. The DPG or similar adsorption test, although correlating better than the volatile-matter test, is therefore not capable of predicting with precision the rubber-compounding behavior of standard (rubber) carbon black.

Carbon-black adsorption is much more marked in the alkaline than in the acid range.

While heat-activated carbon blacks show marked increase in DPG adsorption, heat-deactivated carbon black shows greatly reduced alkaline and slightly increased acid adsorption, which probably explains the anomalous iodine adsorption of heated blacks noted in the literature.

In litharge compounds without added fatty acid, high-adsorption blacks spoil the cure by removing the fatty acid present in the rubber. Heat-deactivated carbon black leaves the cure relatively unaffected. In litharge compounds containing an excess of added fatty acid, however, both heat-deactivated and high-adsorption blacks improve the cure, doubtless through removal of excess acid. In general for carbon black-litharge compounds a low-adsorption carbon black is preferable because it permits a minimum dosage of fatty acid.

For entirely unaccelerated rubber mixings heat-deactivated (low-adsorption) carbon black exhibits striking improvement in physical properties.

The adsorptive properties of carbon blacks have been turned to advantage in the fields of rubber insulation and insulating oils. High-adsorption, heat-activated carbon blacks are shown to advance the cure of rubber mixings vulcanized with *m*-dinitrobenzene. Specially activated carbon blacks have been developed which show a higher (alkaline) adsorptive effect than the active chars now on the market. It has been found possible to produce new grades of carbon black in which both the magnitude and direction of adsorptive activity are under control.

[1] Presented before the Division of Rubber Chemistry at the 81st meeting of the A. C. S., Indianapolis, Ind., Mar. 30 to Apr. 3, 1931. *Ind. Eng. Chem.*, June, 1931. pp. 646-49.

[2] Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

[5] Bierer and Davis, *Ind. Eng. Chem.*, 18,348 (1926).

[6] Cranor, India Rubber Tire Rev., 27, No. 12, 26 (1927).

[7] Holt and Wormeley, Bur. Standards. *Tech. Paper* 294 (1925).

Rubber Division, A. C. S.

Officers

At the recent meeting in Buffalo, N. Y., the following officers of the Rubber Division, A. C. S., were elected for the coming year: Chairman, E. R. Bridgwater; vice chairman, L. B. Sebrell; secretary-treasurer, H. E. Simmons; sergeant-at-arms, Ed. Nahm; and executive committee, H. A. Winkelmann, W. N. Jones, N. A. Shepard, H. R. Thies, and S. M. Cadwell.

The spring meeting of the division will be held at Detroit, Mich., some time in February, 1932, in place of the regularly scheduled spring meeting of the American Chemical Society which will be held in New Orleans, La. Doubtless a larger attendance will be secured by selecting for the meeting a city centrally located to the rubber manufacturing industry.

New York Group

The New York Group, Rubber Division, A. C. S., will hold its fall meeting on October 7 at 6:30 p. m., at the club rooms of the Building Trades Employes' Association, 2 Park Ave., New York, N. Y.

Two speakers are scheduled on the program. W. J. McCourtney, of Chrysler Corp., Detroit, Mich., will present a paper on "Latest Uses of Rubber in Automobile Construction." J. W. Bicknell, managing director of the United States Rubber Plantations, Inc., 1790 Broadway, New York, will lecture on the motion picture film to be shown of his company's rubber plantations.

Dinner tickets will be $2 and may be obtained from J. P. Coe, secretary-treasurer, 1790 Broadway, New York, in care of Naugatuck Chemical Co.

Crystallized Rubber[1]

THE authors discuss the present position in regard to crystallization of rubber by other means than stretching. Referring to crystallization of purified and dissolved rubber as observed by Pummerer and Koch in 1924, the following statements are made: The X-ray diagram of this rubber strongly resembles that of the α-modification of gutta percha hydrocarbon. Since subsequent experiments failed to produce such crystallized rubber, gutta percha or balata must have been present in the original rubber used in the experiments.

The observation of W. H. Smith and of the Bureau of Standards that by cooling an ether solution of rubber to —80° a few rubber crystals were obtained is regarded with some skepticism since nothing is known regarding optical behavior, X-ray diagram, melting-point, etc.

The authors X-rayed a 1 per cent rubber ether solution at —70°. The liquid had completely congealed, but no crystal interferences were obtained. The precipitations, even though like threads, are not rubber crystals, but congealed rubber-ether gels.

Finally the authors say that up to the present it has not been possible to crystallize rubber from a solution either by purifying or submitting to very low temperatures, and that only in stretched or "frozen" samples of most types of crepe is there any crystallized rubber.

[1] R. Pummerer and G. v. Susich, *Kautschuk*, June, 1931, pp. 117-19.

Proofing Paperboard Containers

An industrial fellowship for research on moistureproofing and greaseproofing paperboards used in cartons and boxes has been established in the Mellon Institute of Industrial Research, Pittsburgh, Pa., by the Robert Gair Co., New York, N. Y. Recent progress in package merchandising has indicated a growing need for paperboard containers with improved moistureproofing and greaseproofing qualities, and it is expected that technically valuable advances will result from the studies which were begun on September 1. Marion D. Coulter has been appointed a Fellow of the Institute to conduct these scientific investigations. He is a specialist in organic chemistry and during the period 1925-30 held a Mellon Institute fellowship for the study of certain problems in cellulose technology.

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Technical Communications

The publishers of INDIA RUBBER WORLD are not responsible for statements and opinions appearing in this department

Rubber Printing Ink

IT IS usually desirable to mix the colors for printing inks into the cement without milling them into the rubber. To accomplish this mixing and to produce an ink free of color chunks, it is best to mix the color with about three times its bulk of the solvent used for the ink, i.e., naphtha, benzol, carbon tetrachloride, turpentine, or kerosene, or a mixture of these. This solvent pigment mixture is allowed to stand for about an hour with occasional stirring. Then the rubber cement which is used for a binder is poured into this solvent pigment mixture with continuous stirring. The above procedure applies to any cement where it is desired to incorporate pigments without milling them into the rubber. Data from R. R. Olin Laboratories, Akron, O.

New Styles in Carbon Black

SINCE the beginning of the carbon black industry about 1860, until very recently, no essential change was made in the character and properties of the carbon black particle. During the last three years, however, research has finally led to artificial control of the properties of carbon black in various directions. Modifications of the manufacturing process have led to newer styles in carbon black with improved compounding values.

The color of carbon black can now be exactly controlled, and in the past two years grades of carbon black have for the first time been produced with color strength equal to that of organic dye toners. These carbon blacks are superior to all toners in that the color is fast, does not bleed or fade upon exposure to weather.

Heretofore the bane of all carbon black compounding has been its removal effect on organic accelerators. This has no doubt increased the cost of rubber manufacture by millions of dollars during the course of a ten-year period.

This drawback to the quality of carbon black has finally been eliminated by manufacturing carbon black under such conditions as largely to eliminate the adsorption of oxygen. In the form of Ultramicronex a carbon black of this type has now reached the stage of large production and is used all over the world.

By the simple expedient of exposing carbon black to two immiscible liquids accompanied by a reversal of phase, carbon black is now available in a dustless form and yet perfectly dispersible in all types of rubber compounds. This new style of carbon black is now sold to many medium and small manufacturers in many different countries, and it eliminates the trouble of darkening their various colored mixings.

Carbon black for electrical insulation is now in commercial application in America, Sweden, and Germany. It has recently been found that up to 15 per cent of suitable carbon black may be used in the inside stock of wire compounds with benefit both to the dielectric and the physical properties after vulcanization. This astonishing and apparently paradoxical result that a conducting substance may and does improve the electrical resistance of rubber compounds is due to the fact that a suitable grade of carbon black will remove the final traces of electrolytes and moisture from rubber insulating compounds and retain them harmless.

Now that the basic properties of carbon black have been shown to be amenable to scientific research, there is an increasing commercial trend toward the newer styles although the older styles of carbon black are still used in great volume.

Data from Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

Thixotropic Colloidal Dispersions

THE term thixotropic is applied to the phenomenon exhibited by colloids of forming with their dispersive media a reversible gel, sometimes elastic, which can be transformed into a liquid condition or sol by the effect of motion, stirring, pressure, etc. The dispersions liquefied in this manner, when left at rest, revert to the state of a gel. This operation can be repeated at convenience or at least for a considerable number of times.

Substances exhibiting thixotropic properties are found in nature, but can also be prepared in the laboratory. Bentonite, a colloidal American clay, is an example of a natural colloid with thixotropic properties.

Colloidal dispersions of rubber, either artificial or natural, such as latex, can be brought into the thixotropic condition by arranging for the presence of thixotropic colloids, for example, by adding bentonite to the latex itself. The only point to be considered is that the final concentration and also the electrolytes present in the latex, do not adversely affect the thixotropic condition.

Examples

1. To 100 cc. of 35 per cent latex are added 3.5 grams of bentonite in the form of a 12 per cent aqueous suspension; whereupon a thixotropic latex is formed.

2. 100 cc. of a 35 per cent latex are treated with 3 grams of bentonite (in the form of a dialyzed bentonite suspension) and 15 cc. of a 10 per cent solution of caustic potash. By this means the mixture, comprising the bentonite present in the latex, is rendered thixotropic.

The method is not restricted to pure dispersions, but includes also mixtures of such dispersions with filling, coloring, and vulcanizing agent. Their industrial application is in making dipped rubber goods. A single dipping suffices to produce an article with walls up to several millimeters in thickness. They are equally applicable in the case of coating fabrics by spreading. The act of spreading liquifies the compound and enables it to flow smoothly under the knife.

When applied on the fabric, the material reverts at once to the state of a gel and, consequently, does not give rise to any irregularities through running. Data from U. S. Patent No. 1,814,473, July 14, 1931.

V-Flat Drives

THE major portion of the cost of any multiple V-belt drive is for the sheaves, and naturally the larger sheave is the more expensive. Manifestly, anything which can be done to reduce the cost of the driven sheave will mean a real saving.

Normally a multiple V-belt drive consists of two grooved sheaves and a set of belts. The wedging and locking action of the belts in the sheave grooves produces a pressure for transmitting power several times as great as can safely be obtained in flat belt drives through belt tension. This is the reason for multiple V-belt drives having such marked ability to operate efficiently with high speed ratios and short shaft centers.

It is obvious, however, that with a high ratio and close centers, the area of contact on the large sheave is several times as great as that on the small. It has been proved through laboratory and field tests that under certain conditions a flat face pulley of iron, steel, or wood may be substituted for the large sheave without diminishing the effectiveness of the drive. This is due to the fact that the greater contact on the flat pulley balances the wedging action of the belts in the driver sheave grooves.

Quite evidently, only a V-belt of entirely uniform construction can be used in this manner on a flat face pulley.

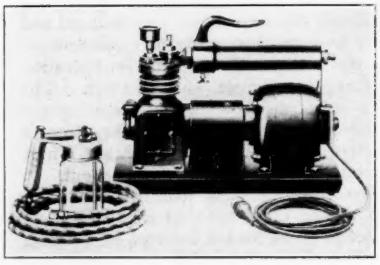
V-flat drives are suitable for almost all power transmission requirements, especially those where high speed ratios and short shaft centers are desirable. Old flat belt, gear, and chain drives may be modernized with little expense. Usually the only equipment needed for such a conversion will be the motor sheave and the necessary belts since the old flat pulley (or gear or sprocket fitted with a flat steel band) will serve satisfactorily as the driven pulley. If not, a flat pulley of proper size can generally be obtained at a low cost. Data from the Gates Rubber Co., Denver, Col.

New Machines and Appliances

Spray Painting Outfit

AN IMPROVED small portable spray painting outfit, easily operated and carried by one person, has recently been announced by The DeVilbiss Co., Toledo, O., manufacturer of spray-painting and spray-finishing equipment.

This low priced outfit, known as the DeVilbiss NC-607, is recommended for use by master painters, decorators, contractors, builders, and others as supplemental equipment for touch-up work on small sized painting or refinishing jobs. It is designed for small maintenance painting in residences, stores, hotels, theaters, public buildings and for refinishing furniture, store, office, and home equipment.



DeVilbiss Spray Finishing Equipment

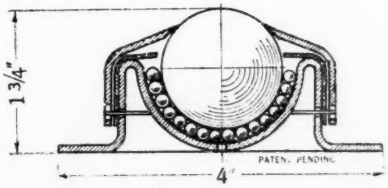
This outfit is electrically driven and operates economically on any light socket. The compressor and the motor are compactly and securely mounted on a rubber footed metal base.

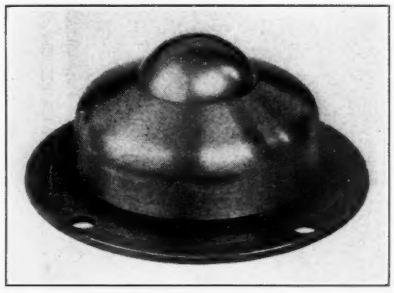
Ball Transfer Conveyer

A NEW type of handling equipment, known as the ball transfer, is designed to accommodate the movement of any object, having smooth hard surfaces in any direction on a horizontal plane. Its application is not confined to any particular type of work or to any one industry.

This modern conveying device is made up with a large hardened steel ball, which rotates on a series of smaller balls held in a cupped base as shown in the illustrations. A dust and dirt cap rests on the ball, being held in position by a spring retainer. Its knife edge contact with the large ball deflects foreign substances which might clog the supporting balls if admitted to the base.

Two models are available, one for mounting in series on a table of flat surface support, and one for mounting on pipe supports. When mounted in groups on a heavy structural support, these ball transfers provide a very effective means of moving heavy shapes, for conveying boxes to and from a line of roller or power conveyer, for handling heavy molds when these loads are placed on smooth bottom plates. The ball table, as it might be termed when a group of the ball transfers are used, also serves as an efficient turn-

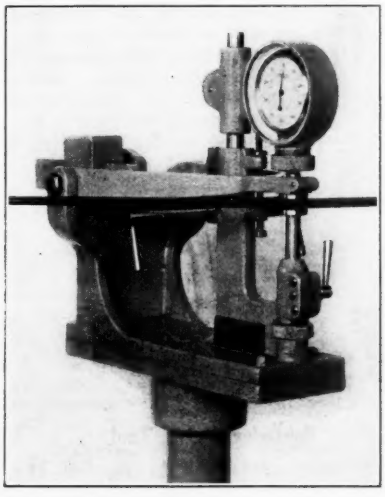




Matthews Ball Transfer

table for rotating heavy work in machining operations. When mounted on pipe supports fixed in the floor in any desired arrangement, these transfers provide an ideal bed on which large plates and other materials of this sort can be moved.

The type 200 ball transfer pictured is constructed with a 4-inch diameter round base, with four holes for mounting. Another type has a 3-inch square base with four holes for mounting, and a third type has a threaded coupling base for 2-inch standard pipe. These three have a load rating of 200 pounds each and are equipped with a 1½-inch diameter hardened steel ball supported on one hundred and five 3/16-inch diameter hardened steel balls carried in a heavy hardened steel base. Mathews Conveyer Co., Ellwood City, Pa.



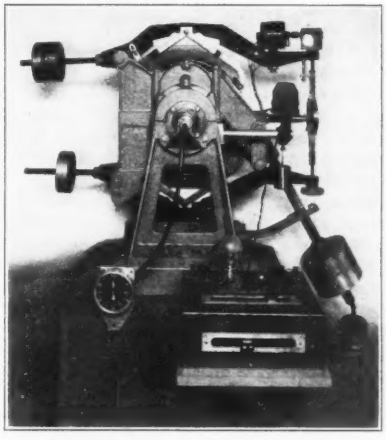
Amil Studios

Federal Wire Gage

Brake Lining Tester

THE machine here pictured was developed at the Bureau of Standards and used there in researches on brake linings for government services.

The test equipment is built on the lines of a cradle-dynamometer so that the torque may be measured on the frame of the machine, regardless of the method of drive for the shaft carrying the brake-drum. The oscillating frame supports the two pressure arms, each carrying a brake shoe.



Brake Lining Testing Machine

The pressure is applied by the adjusting linkage connecting the front ends of upper and lower pressure arms; this includes a ring gage for measuring the tension in this linkage, and from the readings of this gage the pressure on the shoes is computed.

One of the tester's features is an automatic pressure regulator, which keeps the load on the lining constant during a life test. The testing machine comes equipped with a ring dynamometer by means of which the friction between lining and drum is measured, and also a tachometer for indicating the speed. American Instrument Co., Inc., 774 Girard St. N. W., Washington, D. C.

Wire Gage

THE measurement of wires to the accuracy of .001-inch can be easily effected by the instrument shown in the accompanying illustration. This device is built as a bench tool with dial gage graduated to .001 of an inch and a range from .0 to .2-inch. The indicator is enclosed in a dustproof auxiliary housing. The anvils are interchangeable in sizes as specified, with safety rocker arm attached for holding them out of contact. An adjusting screw is provided for instantly setting the anvils to any desired size. Compensating weights are fitted to adjust for proper tension. Federal Products Corp., Providence, R. I.

Newark U. S. Standard Test Sieves

Testing Screens

IN THE rubber compounding laboratory a testing screen is invaluable and should be constantly at hand for testing the freedom of powders from grit, etc. The illustration pictures a nest of three brass U. S. standard series as assembled with bottom pan and cover. These are the latest development in testing sieves. They are made so that they cannot catch and hold the material being tested. The inside surface is smooth. Instead of having corners like ordinary sieves these are without corners, wrinkles, or pockets. All soldering is upon the outside; therefore the wire cloth can be more easily replaced. The cloth is applied without being distorted in any way; consequently every square inch of the screen is accurate and dependable.

These testing sieves are made in all sizes and meshes in strict conformity with United States Bureau of Standards specifications. Newark Wire Cloth Co., 351 Verona Ave., Newark, N. J.

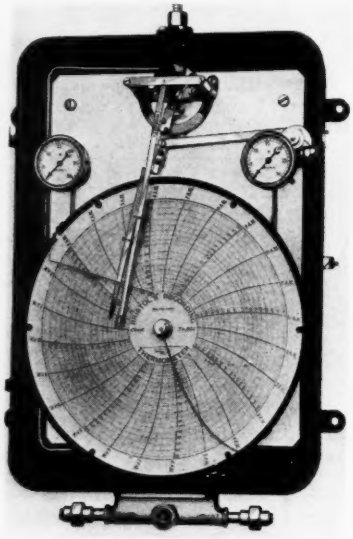
Recorder Controller

A NEW departure in air-operated control employs a free vane as the initiator of the control. This instrument is here pictured as applied to a recording thermometer.

The free vane feature is attached to and actuated by a measuring element of a temperature or pressure recording system and moves between two air jets with stream lines coinciding and placed opposite each other. In passing into these air streams the free vane varies the amount of air which escapes from the jets, thus effecting control.

The arrangement and the design of the two jets and the free vane are such that the vane floats between two equal air streams at right angles to its motion; hence the position and movement of the measuring elements are not affected. The recording device is, therefore, free to reproduce the temperature or pressure with complete accuracy. Control from a frictionless device as described above permits the use of supersensitive measuring systems with which are also coordinated the features of ruggedness and simplicity.

This recorder controller is enclosed in a two-part cast aluminum case of moisture-proof construction. It is furnished with inverted pen arm and fountain pen as standard equipment. The chart is rotated by a powerful spring clock or Bristol telechron operated clock. The case is available for wall or flush mounting. It is made as a single or two-pen instrument in combination of pressure or temperature and has a pressure range up to 1,500 pounds per square inch and temperature range up to 1,000° F., using 12 inch charts.

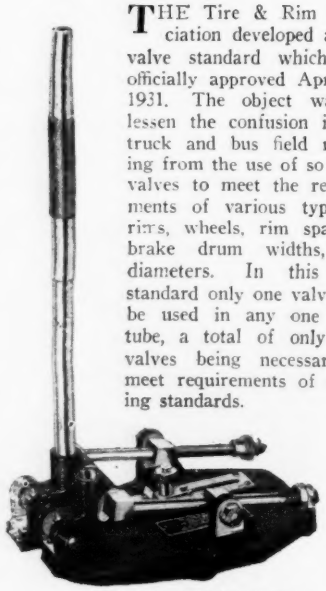


Bristol Free Vane Controller

Temperature measuring systems may be either vapor or gas filled, depending on the operating temperatures encountered. The Bristol Co., Waterbury, Conn.

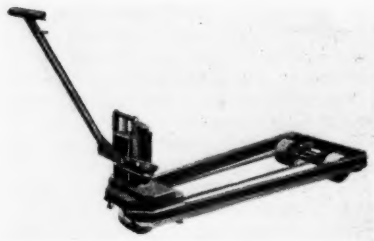
Duplex Valve Converting Tool

THE Tire & Rim Association developed a new valve standard which was officially approved April 16, 1931. The object was to lessen the confusion in the truck and bus field resulting from the use of so many valves to meet the requirements of various types of rims, wheels, rim spacings, brake drum widths, and diameters. In this new standard only one valve will be used in any one sized tube, a total of only four valves being necessary to meet requirements of existing standards.



Schrader Valve Tool

The new valves will be supplied in straight form for the smaller sized tubes and in single bend form for the larger sizes. They may be bent to meet requirements of all existing standards by means of the duplex valve converting tool here illustrated. This handy device was designed for and approved by The Tire & Rim Association. A. Schrader's Son, Inc., Brooklyn, N. Y.



Lyon Lift Truck

Hydraulic Lift Truck

THE hydraulic lift truck pictured has a 3-inch vertical lift and a capacity of 6,000 pounds. This truck was designed and built as a modern piece of equipment in the materials handling field. Its operating features are simple and effective. The load is elevated by merely operating the handle with long or short strokes from a fraction of an inch to a full stroke. There are no ratchets or pawls to throw out.

For quickly raising moderate loads 3½ full strokes raises the load a full height of 3 inches. The load is lowered by pressing the lever located just below the cross bar of the handle. By releasing pressure on the lever the load may be stopped at any point desired.

Other advantageous features of the truck are that it has a turning radius of 360 degrees; the operator can elevate or lower the load from any position; the handle is balanced and will remain in any position by itself. It is also arranged so that the handle cannot be left in a position on the floor when the truck is not in use. Lyon Iron Works, Greene, N. Y.

Rubber Shackle Bushing

A METAL encased rubber bushing known as the Inlox bushing is an anti-vibration device designed for use with an oscillating movement of limited amplitude, not over 45 degrees unless specified. It operates silently, without wear, and, therefore, requires no lubrication or upkeep.

This elastic articulating joint consists of an inner tube covered by a resilient rubber cushion held under high pressure by an outer concentric sleeve. The rubber cushion, being stretched and under pressure between the steel sleeves, exerts a radial compression force so intense as to prevent slip. Movement, therefore, between the inner and the outer sleeve is circular only and accommodated by the stretch of the rubber cushion. Lateral or end movement is practically impossible.

This bushing finds a broad field of usefulness in spring shackles for automobiles, steering and brake rods, radiator supports, clipping head lamps, hinges, latches, and the flexible suspension of engines. The Inland Mfg. Co., Dayton, O.

New Goods and Specialties

Carton Packed Asbestos Sheet Packing

Thermoid Developments

THE THERMOID COMPANY, Trenton, N. J., for the use of repair shops and garages now offers its High Grade Asbestos Sheet Packing in heavy cardboard cartons. One number holds a sheet 50 by 10 inches for cutting all types of gaskets. Sheets of standard size, 50 by 10 inches, 25- and 50-inch squares for general use, are also put in cartons of convenient size.

Another Thermoid product is a 90° segment for the American Cable Co. True-Stop Brake. This brake is a departure from the conventional propeller shaft brake in that pressure is applied to both sides of a disk-drum by opposing flat shoes instead of a contracting band working on a cylindrical drum.

Thermoid segments have those heat-resisting qualities necessary to a constant, unvarying friction coefficient even under extreme surface heats generated by high rotating speeds of the propeller shaft. A new method of construction gives Thermoid Segments a wear factor of several times that of an ordinary facing.

Xetal Rubberized Hair

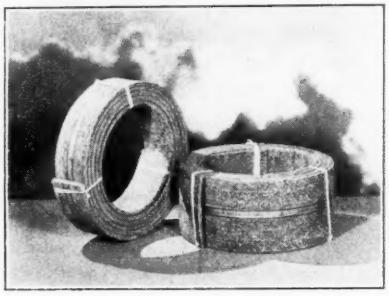
RUBBERIZED hair and vegetable fibers are being prepared in England by a patented process utilizing compounded latex. The material is generally made in sheet form, from which sizes and shapes may be cut as desired. By this process of rubberizing, the natural resilience of the hair is increased and rendered permanent, thus interlocking the hair and entirely eliminating the labor of spreading or teasing ordinary loose hair in the usual way. Not only is the product more resilient, but this feature can be varied within a wide range from a very springy quality to a dense mass.

The rubberized material has been found suitable for upholstery, bedding, cushions, and seatings for vehicles; also as a stuffing for saddles, horse collars, boxing gloves, and pads for sporting garments. Another important development is that it can be compressed, thus forming a material suitable for an underlay for carpets and linoleum. It is, of course, resilient to the tread, and sound and shock absorbing. In a certain thickness and density it provides suitable material for inexpensive types of typewriter pads.

The fact that rubberized hair is both insulating and non-inflammable enables it to be used advantageously as an insulating material, and being firmly interlocked it can be economically used in sheet form as a lining for refrigerator chambers of all types, being easily joined and secured in any desired position. Xetal Products Ltd., King and Princess Sts., Long Eaton, Nottingham, England.

Industrial Brake Lining

THE folded and molded brake lining illustrated is built for highest efficiency in industrial service. It is constructed of high quality asbestos cloth impregnated with a special rubber compound, then folded, molded, and vulcanized under 2,000 pounds' pressure. The type of heavy duty for which this brake lining is exceptionally well adapted is that encountered in excavating machines, concrete mixers, lift bridges, elevators, industrial locomotives, and airplane catapults. The Garlock Packing Co., Palmyra, N. Y.



Garlock 701 Brake Lining

Latex Shipping Container

WHEN the fiber drum was first introduced as a bulk package, it was offered as a cheap substitute for the wooden barrel and the steel drum. Service was sacrificed to price with the result that the fiber drum failed of its purpose. The inventor of the sealed fiber drum, here illustrated, realized, however, that it could be scientifically developed to meet the need for a bulk package to give maximum protection to sensitive chemicals and continue this protection until its contents were exhausted. This was effected by the simple device of a triple seal closure which made possible the use of the natural strength of a cylindrical shell in a container that would be made tight and could be easily opened and closed innumerable times.

How this requirement is met is seen by reference to the illustration as follows: A is a specially treated disk stretched under the wood head B, which is flanged and has straight sides tapered at the bottom for a wedge fit. C is an angle shaped, hinged, self-locking steel rim. D, nails or pail clips are driven through rim, shell, and seal into the head. E is the laminated fiber shell, which is treated inside with a special composition to render it impervious to latex. F is a japanned ring convenient for pulling out the top head after the nails are drawn and the rim removed. No metal is on the inside of these drums; this construction eliminates one of the difficulties in shipping latex.

Carpenter Latex Shipment Drum

For latex shipments these drums are sent to the rubber plantations in nests of four having a total capacity of 137 gallons. They can be laid down at the plantations at less cost than metal drums, and because of their light weight can be returned filled with latex at a saving in freight and without any duty on incoming containers. Nested drums, of course, cannot be treated here with the special compound mentioned above, but the compound can be shipped with the drums and applied at less expense on the plantations than in this country. Carpenter Container Co., Bush Terminal, Brooklyn, N. Y.

Armstrong's Glazing Strip

ARMSTRONG'S Glazing Strip, or Corkfabrik as it is also known, is said to be an ideal material for the setting of automobile glass. It is composed of high quality granulated cork, combined with fresh, live rubber, pressed on a sturdy fabric reenforcing. The high friction of the cork holds the glass firmly in place; while the combination of cork and rubber provides a permanently resilient cushion.

It is made in two different styles. The V-3 type has the cork and rubber facing on only one side of the fabric; while the V-4 type is coated with cork and rubber on both sides of the fabric reenforcing. This Corkfabrik is available in three different thicknesses, 1/32-, 1/16-, and 3/32-inch, and three different widths, 1, 1½, and 2 inches. It is furnished in reels, containing 100 lineal feet. Each reel is individually packaged in a sturdy plainly labeled carton.

This material will do an efficient silencing and cushioning job. Use it between running board, fender, and splash apron, under brackets for tire carriers, lamps, trunk racks, mirrors, and other accessories, behind instrument board panels, between window and windshield glass and its metal channel.

This glazing strip stays lively, resilient, and pliable. Because of its construction it expands after compression, compensating for loosening of joints. It is waterproof and weatherproof, will not crumble, set, or disintegrate. Armstrong Cork Co., 928 Arch St., Lancaster, Pa.

American Rubber Executives

WILLIAM FRANCIS O'NEIL, pres. *b.* Aug. 21, 1885, Akron, O.; St. Vincent's High Sch., Akron; A. B. Holy Cross Coll., Worcester, Mass., 1907; cost-man, Worcester Tire Fabric Co., 1904-07; mdse. mgr., M. O'Neil Co. dept. store, Akron, 1907-08; with W. E. Fouse in Kansas City, Mo., founded Western Tire & Rubber Co., tires and accessories, becoming pres. and gen. mgr.; founder General Tire & Rubber Co., Akron, 1915, and since pres. and gen. mgr.; pres. Barberton Foundry Co., Barberton, O., since 1915. *Member:* Rubber Association of America, dir.; St. Thomas Hospital Assn., dir., Akron; Akron Chamber of Commerce; U. S. Chamber of Commerce, national councilor; Ohio Society of New York City; Lotos Club, New York City; University, Akron City, Silver Lake, and Portage Country Clubs, Akron; dir. Depositors' Savings & Trust Bank, Bankers' Guarantee Title & Trust Co., Akron Standard Mold Co., Akron. *Address:* business, General Tire & Rubber Co., Akron; residence, 1290 W. Exchange St., Akron.

Howard A. Bellows, dist. mgr. *b.* May 13, 1902, Lapeer, Mich.; grammar sch., Lapeer; and Powhatan Court House, Va., sch., 1916; clerk, operator, Western Union Tel. Co., 3 yrs.; first class radio-aviation electrician, U. S. Navy, 2 yrs.; clerk, Philadelphia post office, 1 yr.; in charge specialty sales, vacuum cleaners, and washing machines, Philadelphia, 1 yr.; Virginia sales, du Pont co., paints, 1 yr.; joined General Tire & Rubber Co., Aug. 1, 1924; Virginia salesman, 3 yrs.; assist. dist. mgr. Eastern Div., 2 yrs.; mgr. of same div., 2 yrs. *Member:* New York Athletic Club, New York, N. Y. *Address:* The same.

Charles C. Gates, pres. *b.* Nov. 26, 1877, Waterford, Mich.; Waterford High Sch., Detroit Bus. Univ., Univ. of Mich., B.S. and E.M. Mich. Coll. of Mines, Sept. 1903; field engr., American Bridge Co., 1901-03; bldr. of metallurgical plants, Denver, Col., 1903-05; mineral exploration and field engr., Nevada and Arizona, 1906-09; consulting engr., Denver, 1910-11; incorporated Colorado Tire & Leather Co., Denver, 1912, which in 1918 became The Gates Rubber Co. *Member:* Honorary Engineering Fraternity, Tau Beta Phi, Masonic orders including Shriners (El Jebel), Motor & Equipment Assn., and Rubber Mfrs. Assn. *Address:* business, The Gates Rubber Co., 999 S. Broadway, Denver, Col.; residence, "Chateau Gates," Evergreen, Col.

John A. MacMillan, pres., gen. mgr. *b.* 1872, Prince Edward Island, Canada; local sch. and, with special diploma, Prince of Wales Coll., Charlottetown, P. E. Isl.; after several years gen. mgr. The Dayton Rubber Mfg. Co., Dayton, O., became pres. in 1916, and since in same position. *Member:* Soc. Auto. Engrs., Dayton Engrs. Club, Dir. Union Trust Co., Bureau of Community Research, Chamber of Commerce, Association for Dayton, etc. *Address:* business, The Dayton Rubber Mfg. Co., Layton, O.; residence, 646 Runnymede Rd., Dayton, O.

The brief personal sketches to be published on this page will eventually form a valuable record of the part played by American rubber executives in the progress of the industry. Presidents, vice presidents, secretaries, treasurers, sales and advertising managers, and other "key-men" are invited to send us their biographical data.

Philip John Kelly, advg. mgr. *b.* May 25, 1896, Chicago, Ill.; Univ. of Illinois, Coll. of Com., leaving in last year to join U. S. Army as military aviator, 1st lieut.; Goodyear Tire & Rubber Co., salesman, 1919-24; Hupmobile dealer, Chicago, 1924-25; Mason Tire & Rubber Co., advg. mgr., 1925-27; joined Goodrich staff, 1927, as asst. advg. mgr.; advg. mgr., Aug. 15, 1928. *Member:* Assn. National Advertisers, v. pres.; American Legion; Twin Lakes Country Club. *Address:* business, The B. F. Goodrich Rubber Co., Akron, O.

Arthur Farragut Townsend, chrmn. brd. *b.* May 17, 1865, Boston, Mass.; Boston Latin Sch., Massachusetts Institute of Technology, grad. mech. arts, 1884; New York Belting & Packing Co., June, 1884-Oct., 1893, advancing from shipping clerk to asst. factory mgr.; an incorporator of Manhattan Rubber Mfg. Co., Oct., 1893, becoming sec.-treas., later v. pres., and pres. from Mar. 3, 1903, to Sept. 15, 1929; chrmn. of brd., Raybestos-Manhattan, Inc., since Sept., 1929; pres. The Manhattan Securities Co., dir. Passaic (N. J.) Nat. Bank & Trust Co., dir. National Iron Bank of Morristown, N. J.; dir. Reynolds Spring Co.; veteran 7th Regt. and Squadron A, N. G. N. Y. *Member:* New York Yacht Club, director, Rubber Mfrs. Assn. *Address:* 61 Willett St., Passaic, N. J.

Joseph Paul Woodlock, sales mgr., eng. *b.* Mar. 22, 1894, Fowler, Ind.; B. S., Lewis Inst. Univ. Chicago, 5 yrs. engrg., 1923; A.M., business admin., 1925; asst. prof. business admin., Univ. Utah, 1925-26; sales div., B. F. Goodrich Co., Akron, O., 1926; merchandising mgr., Goodrich Silvertown, Inc., 1930; gen. mgr. same, 1931, special retailing field. *Member:* Alpha Kappa Psi. *Address:* 500 S. Main St., Akron, O.

Charles W. Seiberling, v. pres., treas. *b.* Jan. 26, 1861, Western Star, O.; Akron pub. schs., 2 yrs. Oberlin Coll.; dir. and supt. J. F. Seiberling Co., 1885-95; sec. and dir., Akron India Rubber Co., 1895-98; v. pres. and dir., Goodyear Tire & Rubber Co., 1898-1921; v. pres., Seiberling Rubber Co. since 1921, also treas.; pres., Thomas Phillips Co.; pres., Seiberling Latex Products Co. since 1928; pres. brd. trustees, Kent State Coll.; treas. brd. trustees, Springfield Lake Sanatorium; with father helped organize Akron India Rubber Co. 1895, and with brother, Frank A., the Goodyear Tire & Rubber Co., 1898, and the Seiberling Rubber Co., 1921; dir., First City Trust & Savings Bank, Citizens Savings & Loan Co., First City Savings Bank of Barberton, Akron Rubber Reclaiming Co. *Member:* Akron City Club, Akron University Club, Better Business Bureau, Akron University Endowment Assn., Ohio Society of New York. *Address:* residence, Northfield, O.

Wm. O. Rutherford, pres. *b.* 1874, Fairview, Pa.; grammar sch., business Coll., Akron, O.; officer in 8th Ohio Volunteers, Spanish-American War, 1898; joined The B. F. Goodrich sales force, 1900; represented Goodrich in Detroit, Mich., and later made Denver, Col., dist. mgr. and Buffalo, N. Y., branch mgr.; returned to Goodrich works, Akron, becoming asst. to V. Pres. H. E. Raymond; asst. gen. mgr. sales, 1914; gen. mgr. in charge of sales, 1916; 2nd v. pres. in charge of sales and member exec. com., 1918; resigned as v. pres., Jan., 1928; v. pres. Rubber Assn. of America, 1922, and was dir. and three times pres., first in 1924; head of foreign trade commission Motor & Accessory Mfrs.' Assn., 1922, was dir. and pres., 1923; served and dir. Lincoln Highway Assn. and Pan-American Highway Education Brd.; pres. and dir. Pennsylvania Rubber Co. of America, Inc., since May 17, 1928. Mason (32d deg.), Shriner, Knight Templar. *Member:* Portage Country, Akron City, Detroit Athletic clubs, and life member Army of Santiago. *Address:* business, Pennsylvania Rubber Co. of America, Inc., Jeannette, Pa.

Rubber Industry in America

OHIO

Goodyear Developments

Goodyear Tire & Rubber Co., Akron, through Goodyear Service, Inc., a subsidiary, is investing $500,000 in a new sales and service station at Chester Ave. NE. and E. 13th St., Cleveland, a site personally selected by President P. W. Litchfield.

Mr. Litchfield awarded William G. Myers with a 25-year service pin and $250 in gold for his long service with the company. His first job was laying up fabric plies in the first tire room at 15 cents an hour; later he went on piece work and averaged 22½ cents an hour. He inspected tires from the first tire building machine. Mr. Myers worked in the tire room until 1918 when he was transferred to the experimental job shop, where he has served ever since.

Goodyear held a two-day celebration for 360 dealers from all parts of the country who were winners in the annual "Zeppelin" sales races. The celebration included a parade, a barbecue dinner, sports program and rides in Goodyear blimps, a dinner followed by a 10-act vaudeville show staged by local Goodyear talent, inspection tour of the Goodyear-Zeppelin dock and factories.

Airwheel Type Tire

Airwheel tires are built of extremely large air volume but low pressures designed and used successfully on airplanes to insure safe and comfortable landings. This type of tire is built to be applied to a specially constructed hub forming essentially an all-tire wheel. For three years tire experts have experimented with this big tire in the belief that it may prove the next step in the trend to larger tires and smaller wheels on automobiles. This trend began with the oversize tire, and progressed through the intermediate balloon to the present balloon tire.

The illustration shows a Ford car equipped with the new all-tire wheels. These big tires give greater cushioning effect and are easier riding than the balloon tires in present use. They have greatly increased air volume but require only 10 to 20 pounds' pressure; while the present balloon tire requires inflation from 32 to 40 pounds. The new airwheel gives from 2 to 2½ times more contact with the road surface and thus affords greater tractive and greater anti-skid properties on slippery pavements.

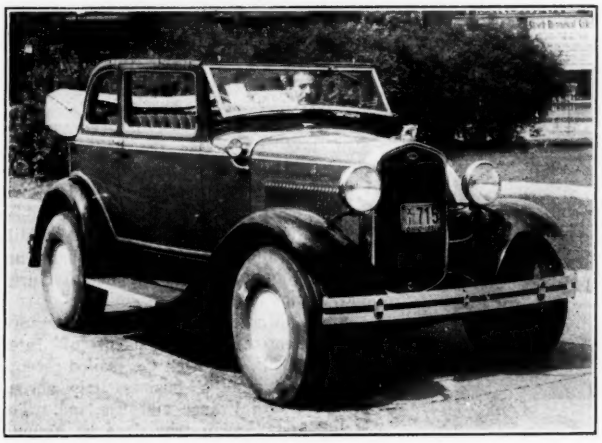
The development of the new tire is still in the experimental stage for trucks and automobiles but is now ready for use on tractors.

The Falls Rubber Co., Cuyahoga Falls, has appointed M. W. Conant, former public relations manager, Miller Rubber Co., and The B. F. Goodrich Co., sales promotion manager, reporting to Vice President F. C. Millhoff, under whom he used to work at the Miller Company.

Dayton Rubber Mfg. Co., Dayton, to increase facilities for warehouse storage and shipping recently completed a one-story, 160- by 180-foot building costing $30,000. This is the ninth erection by Dayton since it moved to its present site in 1921.

The Akron Bronze & Aluminum Co., Akron, reports steady demand for its newly developed special processed aluminum last. Besides these lasts, this concern makes for the trade, aluminum molds for molded toys and novelties, soles, and heels. H. M. Ehmann is president and general manager, and E. C. Cervenka is secretary and treasurer of the concern.

General Manager Hartwig, of the Palmer Gas Products Corp., Shreveport, La., visited Akron last month.



Goodyear All-Tire Wheels on Ford Car

L. P. McGoff

The Netherland Rubber Co., 34 W. Third St., Cincinnati, at a recent meeting of the board of directors, elected Lawrence P. McGoff president and general manager. For the past ten years he represented The Boston Woven Hose & Rubber Co. in this territory and has a wide acquaintance among the trade. The Netherland company leased the 5-story building at 34 West Third St., Cincinnati, to distribute a complete line of rubber goods through the Midwest and South. Other executives of the company include R. L. Wilkinson and J. F. Ducey.

General Tire and Rubber

General Tire & Rubber Co., Akron, has purchased all patents, molds, and sales rights of the Lambert "Trublpruf" cushion truck tires. General now produces this tire, which has had a very successful career, and is particularly popular with truck operators hauling coal, ice, and similar commodities. Eight sizes of the demountable type of tire, 5 of the 'Pressed-on" type, and 3 of the industrial truck type "Trublpruf" tire are now being built.

President William O'Neil, when recently questioned on probable developments in the crude rubber market in the near future, stated: "Have crude rubber prices hit rock bottom and, if so, when will they start going back up again? This question has been asked often lately.

"That is something that no man can tell definitely, but there are some important reasons for believing that it cannot be long deferred. In days when crude rubber was produced at a profit,

the taxes which normally amount to about $80,000,000 a year, were absorbed by the producers who took them out of the profits.

"For the past two years, it has been impossible to take these taxes out of profits as there have been no profits.

"This $160,000,000 in taxes has to be paid, if not from profits, then from the price that must be paid by the rubber buyer. That means that, if the taxes are to be met by the consumer, as they always are met eventually, they must come out of an increased cost of crude to the users of rubber, unless the producer is to receive even less for his product than he is receiving now.

"As a matter of fact, Holland, which depends for about half of its income from its East Indian possessions from crude rubber is now planning an export tax to take the place of the profits tax which has ceased to yield income. This tax must be added to the present cost of rubber.

"For similar reasons, it is inevitable that an eventual upturn in the prices of other commodities to the consumer cannot be long deferred. The Federal Government, of course, depends largely for its maintenance upon receipts from federal taxes."

Aluminum Shoe Lasts

AN ALUMINUM shoe last that has been highly approved and is said by some of the largest footwear manufacturers to be the most perfect last on the market is now offered to the trade. Manufacturers' losses have been unlimited because of the lack of uniformity in ordinary lasts. The rubber stock for the manufacture of goloshes, boots, bathing shoes, etc., is cut true to pattern; and when the shoe makers build shoes on such lasts, they encounter numerous irregularities in size for the reason that the lasts being ground to size are in places a little under or oversize. Naturally this condition necessitates loss of time for cutting and fitting.

The improved lasts are sand cast to correct dimension throughout, thereby eliminating all irregularities of surface grinding and insuring perfect edges. Because of the patented process of holding the core in casting these lasts there are no traces of chaplet marks to cause an ugly imprint in the rubber. Much time is saved in using these lasts, for the stock slips easily on their smooth surface. The illustration shows several aluminum lasts for women's goloshes in which the features mentioned are embodied.

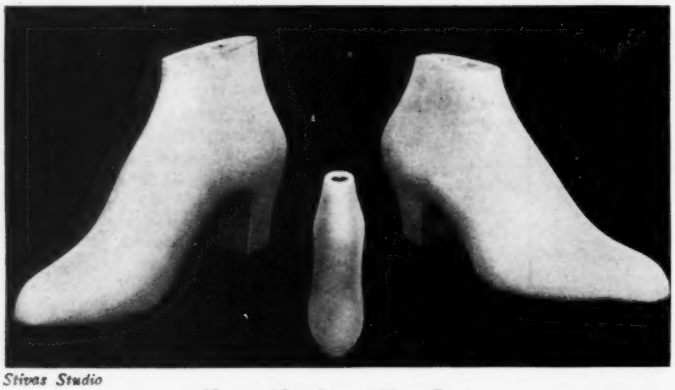
Footwear manufacturers spend a larger amount of money yearly for wood patterns from which the aluminum lasts are made, a separate and distinct pattern being required for each size and style. At the end of the season there may be a change in shoe design causing these patterns to become obsolete and necessitating new patterns for the various sizes.

Under the new patented process the footwear company requires only one pattern for the largest size in the different types, wherewith to produce aluminum lasts in all the various sizes needed, each perfect in every dimension. Thus a large footwear manufacturer's savings in pattern costs in a few years would be very great. The Akron Bronze & Aluminum Co., Akron.

President Harvey S. Firestone, of the Firestone Tire & Rubber Co., Akron, accompanied by his sons, Roger and Raymond, returned last month to Akron after a month's trip to Europe. Mrs. Firestone and two other children, Elizabeth and Leonard, stayed in New York and will return to Akron later. While abroad Mr. Firestone conferred with British industrial officials and visited the Firestone offices in England and on the continent.

Vice President Harvey S. Firestone, Jr., presents the fascinating narrative, or the highlights of it, in a series of brief word pictures which form a part of the Firestone radio program, entitled "The Voice of Firestone," now being broadcast every Monday night at 8:30 o'clock, Eastern daylight time. Aside from Mr. Firestone's short talk, the program is made up entirely of musical features offered by a company of noted radio artists. A nation-wide N.B.C. network carries it to an estimated audience of 40,000,000.

Seiberling Rubber Co., Akron, through President F. A. Seiberling, reported an increase of 46.95 per cent in tire sales to dealers in the first 7 months of this year over the corresponding period of 1930. The company's plant at Akron is at the present time working three 8-hour shifts daily.



Stivas Studio

Akron Aluminum Shoe Lasts

Goodrich Activities

Experiments in using rubber as a preservative of trees, shrubs, and flowers during transplanting are being conducted by The B. F. Goodrich Rubber Co., Akron. Plants to be shipped or transplanted are dipped into a rubber solution so that all but the roots are coated to prevent the dissipation of moisture and to retain the shape and color pigments of the original foliage. Trees are sprayed with the solution. Thickness varies from one to two-thousandths of an inch, according to the length of time the tree or plant is to remain out of the earth.

Personnel Notes

Major changes in the Goodrich organization were announced following a regular directors' meeting in New York, N. Y., September 8.

S. B. Robertson, vice president and general manager, of Pacific Goodrich Rubber Co., Los Angeles, Calif., returns to the Akron factories as vice president and general manager of the tire division. While T. B. Farrington, general manager of the factory service division in Akron was appointed vice president and general manager of Pacific Goodrich, succeeding Mr. Robertson.

Vice President T. G. Graham will be in charge of engineering, processing, development, research laboratories, and all factory service departments. In addition he will direct production of Martha Mills, fabric manufacturing subsidiary at Silvertown, Ga., and of Canadian Goodrich, Ltd., Kitchener, Ont.

There are two changes in the sales organization. A. H. Leavitt, formerly manager of the North-central district, is transferred to Buffalo, N. Y., in charge of the area constituting the Buffalo branch district. He has been with Goodrich nearly 20 years and is a son of the late Percy Leavitt, an associate of Dr. B. F. Goodrich, the company's founder. A. H. Leavitt came to Goodrich from Cornell University and worked in the mill room several years before entering the sales department. He was with General Pershing in Mexico and later was purchasing agent for the United States Government. He returned to Goodrich six years ago.

The other change is the appointment of W. C. Manley to the Pittsburgh division, with territory covering western Pennsylvania, eastern Ohio, West Virginia, and part of Maryland. Mr. Manley formerly was with the Diamond Rubber Co. and the Firestone Tire & Rubber Co. in sales and merchandising capacities.

F. R. Hillgren, Chicago specialty salesman, now represents the Miller Rubber Co., Goodrich subsidiary, as a special representative to the premium trade, James Taylor, sales manager of the Miller rubber toy division recently announced. Mr. Hillgren sells inflatable rubber toys, balls, and other rubber novelties to manufacturers and wholesalers.

V. I. Montenyohl, Goodrich treasurer and executive vice president of International B. F. Goodrich Co., sailed recently for a two months' business trip abroad, principally in France and England. This is his first foreign trip since he assumed

direction of the Goodrich export subsidiary. He is accompanied by his wife.

L. C. Rockhill, who was general sales manager of the Miller Rubber Co. of New York when the Miller interests were acquired by Goodrich, and who has since been retained by the latter in an advisory capacity, has lately been obliged because of ill health to spend much of his time on his farm near Hartville. Before joining the Miller concern Mr. Rockhill had been in the Goodyear service twenty years, having been appointed sales manager in 1919 and elected to the directorate in 1921.

W. R. McKinley, manager of Goodrich Silvertown, Inc., retail stores in Toledo, was a link in the "human chain" which saved many lives at Atlantic City, N. J., several weeks ago when a 15-foot wave rolled over the beach taking several lives and injuring a score of people.

Ten Goodrich employes received 20-year service pins in September. They are: Carl Bouschere, C. L. Harper, and Allan B. Merrill, mechanical goods division; Earl E. Carson, processing; Robert H. Dyer and Karl Schmidt, accounting; Ralph Kaltwasser, tube department; Charles Ruehling, machine shop; Richard Twynham, office service, and E. Royer, Societe Francaise B. F. Goodrich, Colombes, France.

Expansion Joint for Highways

A rubber expansion joint for concrete roads, which will prevent cracking under most extreme temperature has been developed by William R. Thompson, chief engineer for Goodrich Silvertown, Inc. The rubber strip can be inserted under pressure when wood and steel construction joints are removed after the concrete hardens. The rubber joint will last the life of the road, it is said.

National Rubber Machinery Co., Akron, now manufactures and sells the McChesney gage. A favorable demand for all its machinery lines is reported by the company.

C. J. "Curt" Harwich, an executive of the C. P. Hall Co., Akron, is now back on the job and will again start traveling, after having been ill for the past six weeks with sinus infection.

Damascus Mfg. Co., Cleveland, through Mr. March, reports increasing business. Inquiries are more numerous than at any previous time, and a good fall business is predicted.

A new automobile molded rubber spring cover which has been perfected and is in use on Ford and Chevrolet cars is being produced by a Cleveland organization and is looked upon with great favor as to its future sales possibilities. Mr. March is identified with its manufacture.

R. H. Schwartz Rubber Co., Cleveland, manufacturer of molded rubber parts reports increased business because of heavy demands for its newly developed line, antisqueak and antirattling devices.

Dill Mfg. Co., Cleveland, now manufactures and sells convertible truck and bus tube valves, recently approved by the Tire & Rim Association of America. These convertible valves are available in the two standard types, straight and single bend, straight in the smaller size tubes and single bend in the larger sizes. The valves are of the tapered type which makes it possible to bend or convert the two standard types more easily.

EASTERN AND SOUTHERN

U. S. Rubber Reclaiming Employes and Their Safety Record Banner

The American Society for Testing Materials, Committee D-13, will meet in Washington, D. C., October 15 and 16. The tentative program includes subcommittee meetings Thursday, a luncheon at the Bureau of Standards, and a banquet. The general session of the committee will begin Friday morning, and in the afternoon there will be a continuation of the general session, and sight-seeing trips.

E. I. du Pont de Nemours & Co., Wilmington, Del., agreed to purchase the dyestuffs and chemical business of the Newport Company. The Newport plants involved are at Carrollville, Wis., and New Brunswick and Passaic, both in N. J. The wood distillates division of that organization does not figure in the transaction. It is intended that this additional dyestuffs and organic chemical business be consolidated with the dyestuffs business of the du Pont company; also that the policies and operations of the acquired industries shall be continued substantially as heretofore.

Walworth Co., 60 E. 42nd St., New York, N. Y., has purchased the valve business of the Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill.

Restonair, Inc., 10 E. 43rd St., New York, N. Y., handles Restonair mattresses, pillows, pads for stretchers, ambulances, and operating and obstetric tables, and cushions for invalid, lounging, lobby, and club chairs, chaise longues, and couches. Executives include Max Sherover, president; Hermann Katz, director; and Louis Friedman, Jr., secretary.

Schwarzman's Department Store, 52nd St., Philadelphia, Pa., staged a publicity campaign which increased its sales of rubber soled footwear 100 per cent above last year's figures. With the cooperation of a local theater a Keds Contest for children was held where rubber soled footwear and a bicycle were given away.

U. S. Rubber Reclaiming Co., through J. M. Kerrigan, manager, Industrial Relations Department, announced that on August 18, 1931, the Buffalo, N. Y., plant completed one year without a lost-time accident, with a total of 416,718 man hours. The company believes this record was made possible by the active and interested cooperation of the management and by the various departments cooperating with the Plant Safety Committee. Already plans are under way for another year free of lost-time accidents. The firm intends to concentrate on training the new employe regarding the hazards of the plant, and foremen will also be instructed on the best and safest methods of handling the new man.

Standard Tire & Rubber Co., Inc., Hammond, La., has been recently incorporated to manufacture mechanical rubber goods, tires, and tubes. The equipment is thoroughly modern, each machine being motor driven, and there is an ample supply of natural gas for fuel. The plant will be in operation by January or February, 1932, and will employ in the beginning approximately one hundred operatives.

United States Rubber Co., 1790 Broadway, New York, N. Y., through President F. B. Davis, Jr., announced the consolidation of the Advertising and the Commercial Research Departments into one department to be known as the Advertising and Commercial Research Department. Walter Emery, who has been director of the Commercial Research Department since 1922, has been appointed director of the consolidated department. William F. Earls, director of advertising for the past five years, will make another connection, but has not yet announced his plans.

The Amkniga Corp., purchasing agent for Russian concerns, on October 1 will move to 258 Fifth Ave., New York, N. Y. Telephone, Ashland 4-1526.

Vulcanized Rubber Co., Morrisville, Pa., recently installed two new large vulcanizers to take care of fall and winter trade.

William S. Gardiner, treasurer of the Neville Chemical Co., Pittsburgh, Pa., reports increased activity in its line of chemicals.

NEW ENGLAND

Ralph L. Dickey

U. S. Rubber Notes

Ralph L. Dickey has been appointed general sales manager of the General Products Department of the United States Rubber Co., with headquarters at Providence, R. I. Mr. Dickey was graduated with honors in the mechanical engineering course at Yale in 1914, and has had a wide and varied experience in manufacturing and selling. For the past three years he has been Assistant to the General Manager of the General Products Department, specializing on sales promotion work.

U. S. Rubber in Naugatuck, Conn., during the week of September 20 operated its gum shoe department 4½ days a week and the following week on a 5½-day schedule. Of late this department had been running 3 or 4 days a week. Other departments including lumberman's, cloth gaiters, boots, and gum gaytees will continue to operate 4 days a week for the present.

The company transferred R. H. Wickware, of Los Angeles, Calif., to a position at Providence, R. I., where he reported for duty September 15.

Maurice C. Smith, Jr., general manager and vice president of the National India Rubber Co., Bristol, R. I., since August 1, 1925, on September 1 severed his connections with that concern. He had the distinction of rising from the position of stenographer with the plant to president of the company. Mr. Smith has long been an esteemed figure in town.

James J. Drummey, recently promoted to the export contact department of U. S. Rubber, removed his family to New Haven, Conn. He was associated for several years with the National India Rubber Co., Bristol, as technical superintendent.

H. W. Waite, general manager of the Providence plant on September 22 announced that a 5-day week and a 9 per cent cut in salaries and wages corresponding to the reduced length of the work week would be effective at the Providence plant and the wire division at the National India Rubber Co. at Bristol, effective October 1, in accordance with the company's policy adopted for all its departments throughout the country. About 2,500 employes will be affected, including 1,980 at Providence and about 500 at the Bristol branch. The units of the Providence plant include: Golf ball division, drug store sundries, hard rubber, flooring, specialties, and rubber thread divisions.

H. Muehlstein & Co., Inc., dealer in crude and scrap rubber, on September 1 moved its Boston, Mass., office to Room 736, Public Service Bldg., 89 Broad St. Telephones: Liberty 2471-2472.

National Association of Cost Accountants, Boston Chapter, on August 28 held its final meeting of the 1930-31 year, marking the close of the most successful period in the organization since its beginning twelve years ago. That meeting also saw the retirement, as president, of Charles H. Cornell, comptroller of the E. H. Clapp Rubber Co., Boston, Mass., under whose capable guidance the chapter won sixth place in ranking among thirty-six chapters in leading cities.

Heveatex Corp., Malden, Mass., supplies to the trade, normal, concentrated, and processed latex for all industrial requirements.

Davidson Rubber Co., Boston, Mass., founded in 1857, is completing three-quarters of a century of successfully supplying druggists' sundries. During the past three years the company made many improvements in its merchandise and is expanding its operations particularly in the bathing apparel field. For the past two seasons it has manufactured a line of molded bathing caps, and plans for next year include the addition of other molded bathing apparel items. The company also manufactures sponge rubber specialties. Davidson reports fall business satisfactory, the factory operating on full time schedule in all departments.

Archer Rubber Co., 213 Central St., Milford, Mass., increased production, necessitating a night shift. Production is expected to be maintained at capacity until December 1.

Panther Rubber Mfg. Co., 56 Monk St., Stoughton, Mass., recently notified its executives and foremen that they must submit to a 10 per cent wage cut to be effective in the Sherbrooke, Canada, Chelsea, Mass., and Trenton, N. J., factories of the concern. This is the first cut ordered by the Panther officials; and although the company is running two shifts and has built two new factories in Stoughton, officials explained the cut was necessary to meet competing figures on rubber heels of other concerns.

Fisk Rubber Co., Chicopee, Mass., resumed operations after a two-week shutdown, and production schedules will be continued on the 5-day week basis. Officials reported that approximately the same number employed before the shutdown have returned. A slight increase in the number of mechanics employed was made to meet requirements in the machine shop, but this employment will be only for a limited period.

Lee Tire & Rubber Corp., Conshohocken, Pa., according to Guy D. Niles, Boston, Mass., district manager, is now operating on a 24-hour factory shift to keep up with increased consumer demand. The August sales figures for the New England zone are ahead of July and also show a large gain over August a year ago.

The Anaconda Wire & Cable Co. is operating its Pawtucket, R. I., branch with day and night shifts because of orders on hand. The company recently received from the Metropolitan Square Corp., representing Rockefeller interests in the development of the huge broadcasting and amusement project at the Radio City, New York, N. Y., the contract for all the rubber covered wire to be used in more than 15,000 miles of wiring. No expansion of the Pawtucket plant has been made to take care of this work as the contract extends over a considerable period. The Pawtucket plant is also shipping, in lots of various weights as fast as produced, 1,000,000 feet of wire cable to New York for use by public service companies in New York and Texas. Normally the Pawtucket plant employs 250 persons, but for some time a force of about 200 has been maintained.

The Phillips Baker Rubber Co., 58 Warren St., Providence, R. I., recently completed the erection of a large steel smoke stack at its plant.

The Davis-Jones Insulated Wire Co., Providence, R. I., increased its capital stock from $250,000 and 200 shares of common stock of no par value to $250,000 and 5,000 shares of common stock of no par value.

The What Cheer Nipple Co., Providence, R. I., recently incorporated with an authorized capital stock of 200 shares of common stock of no par value and will manufacture rubber goods. The incorporators are Ralph M. Greenlaw, C. E. Waterman, and C. L. Barnbrook, all of Providence.

Report Tire Stocks Promptly

The Department of Commerce will make a survey of dealers' stocks of tires as of October 1. These surveys are invaluable to the tire industry; consequently dealers are urged to report their stocks promptly upon receipt of the questionnaire.

NEW JERSEY

Some branches of the New Jersey rubber industry were quite active during the past month; while others failed to gain. Production of rubber cloth, tiling, and brake lining increased, and the output of hose and belting continues good. Some plants manufacturing hard rubber goods are busy, but others report business less than normal. There has been a decrease in athletic rubber goods. Tire manufacturers report a normal output.

Various rubber products were exhibited at the Trenton Fair during early September by the Essex Rubber Co., Acme Rubber Co., Home Rubber Co., Joseph Stokes Rubber Co., Crescent Insulated Wire & Cable Co., and William R. Thropp Sons Co.

Franklin L. Meyer, chief chemist of the rubber and installation laboratory of the John A. Roebling's Sons' Co., Trenton, resigned after thirty-three years with the concern. He was graduated from the University of Nebraska as an electrical engineer and his first work with Roebling consisted principally of testing insulated wire. When this wire came into common use, Roebling Co. arranged to provide its own insulation and established a laboratory. In 1912 Mr. Meyer was appointed its head. He wrote out the various formulas and a girl mixed the elements. Now fifteen men are employed at this work. Mr. Meyer would even make the laboratory machines in the factory machine shops.

Puritan Rubber Co., Trenton, is experiencing continued normal business, with increased orders for rubber tiling.

Harry C. Wood, Trenton, distributer of United States Rubber Co. tires, recently entertained officials of the First-Mechanics National Bank, Trenton, at his summer home at River Mawr, Yardley, Pa., where the guests participated in games.

Firestone Tire & Rubber Co., Akron, O., has received permission from the City Commission of Trenton to erect a service station and a large store at West Hanover and North Willow Sts.

Luzerne Rubber Co., Trenton, announces no recent change in business conditions. Secretary C. Dudley Wilson and Mrs. Wilson have returned to their home at Princeton after closing their summer residence.

Lambertville Rubber Co., Lambertville, resumed operations in the production department, after having shut down to take inventory and make repairs. The shipping department continued open.

Whitehead Bros. Rubber Co., Trenton, continued busy throughout the Summer and does not anticipate decreased business during the Fall. General Superintendent William A. Howell spent his vacation along the Jersey Coast.

The Ajax Rubber Co. plant, N. Olden Ave., Trenton, will be purchased by the State Purchasing Department for a warehouse.

The Goodyear Tire & Rubber Co., Akron, O., will be asked to reverse its policy in appointing new dealers in Essex County, for thirty-five Essex County Goodyear dealers went on record as opposed to the proposed new policy. The dealers expressed good will toward the company and felt confident that no new dealers would be named.

The Thermoid Company continues busy in all departments. Vice President F. Robert Lee has been on a business trip through the Midwest.

George T. Gretton, secretary of the Home Rubber Co., Trenton, and Mrs. Gretton are vacationing at Lake Champlain.

William H. Sayen of the Mercer Rubber Co. and his wife are spending the season at Seaside Park.

Joseph Stokes Rubber Co., Trenton, announces that business continues normal with an increase in orders for certain hard rubber articles. Its Canadian plant at Welland, Ont., reports improved conditions.

Pocono Rubber Cloth Co., Trenton, states that its plant is very busy in all the departments with all employes working full time.

Essex Rubber Co., Trenton, is experiencing a big revival in business, with the plant operating under normal conditions. Orders have increased greatly during the past thirty days, and future trade prospects are very encouraging.

Pierce-Roberts Rubber Co., Trenton, reports that business declined during last month.

Alfred H. Branham, vice president and receiver of the Murray Rubber Co., Trenton, reports that the concern showed a profit during the past month. He also states that the tire output remains normal.

Firestone Tire & Rubber Co. will start immediate erection of a $350,000, 3-story branch office and service building at Wabash Ave. and 16th St., Chicago, Ill. It is scheduled for occupancy early next February. Three-quarters of the first floor will be devoted to a service station for tires, gasoline, oil, greasing, car cleaning, brake testing and relining, and the sale of accessories.

MIDWEST

Corduroy Tire Co., Grand Rapids, Mich., has elected Roy Murphy vice president. Mr. Murphy, who is only thirty-two, ten years ago joined the company as purchasing agent and recently was made head of the mechanical rubber goods division.

National Safety Council will hold its twentieth National Safety Congress on October 12-16 at the Stevens Hotel, Chicago, Ill., to be attended by over 7,000 safety engineers. To the rubber man will be presented the opportunity to hear R. R. Gross, factory manager of Firestone; to learn of the Goodrich development for freeing airplane wings from sleet and ice, an address by Dr. Shirley; and a live Round Table including "The New Employee," "The Safety Committee," "Compound Room Hazards," "Machinery Inspection," "The Value of Basic Cause Analysis," as well as a number of other timely topics throughout the program. Mr. Gross also will address the General Round Table on "Why We Did Not Slice Our Safety Budget."

The Farrel-Birmingham Co., Inc., of Ansonia, Conn., has opened a new office in Chicago, Ill., 1059 First National Bank Bldg., Monroe and Clark Sts., in charge of Harry Temporal, transferred from the Akron, O., office. He has been a sales representative of the company for twenty-one years, having first joined the Farrel Foundry & Machine Co. at Ansonia in 1910. In 1922 he was transferred to the Cleveland office and in 1928 to the Akron office when the Cleveland and the Akron offices were consolidated. The Akron office, in charge of Andrew Hale, has been moved from the Bank Bldg.

United States Rubber Co., Tire Department, Detroit, Mich., has an "action" sign consisting of an imitation tire made of wood, 8 feet high, weighing 800 pounds, and operating 18 hours daily, that is attracting much attention in Detroit. Action is obtained through a gigantic tire revolving slowly through an opening in the board, as shown in the illustration.

The tire is a faithful replica of a typical United States tire mounted on a wire-spoked wheel. The sign board is located on E. Jefferson Ave., adjoining the University of Detroit.

U. S. Rubber Action Sign

PACIFIC COAST

The general condition of the rubber trade on the Pacific Coast for September was considered quite encouraging. While sales in some lines continued backward, the general tone of business was much improved, especially in collections. Tires were in good demand as a result of much fair weather, and depletion of dealers' stocks resulted in many urgent demands on factories. Rumors were widely circulated early in the month of an immediate rise in prices, but, much to the disappointment of dealers who had hoped for an increase to stimulate sales, nothing came of the report. Some companies which have been doing considerable special advertising in the field report that the returns so far have been quite gratifying. The building trades continue as moderate purchasers of a general line of mechanical rubber goods, but in the oil industry, which is still marking time, rubber goods sales are very slow. A much livelier demand for rubber clothing and footwear was noted late in the month, particulary in the Northwest. An improvement was noted in sales of druggists' sundries and household specialties.

Pacific Goodrich Rubber Co., Los Angeles, Calif., has a new vice president and general manager in T. B. Farrington, until recently general manager, factory division, The B. F. Goodrich Co., works, Akron, O. He succeeds S. B. Robertson, lately promoted as vice president and general manager of the parent company's tire department in Akron, where he went two weeks ago. E. W. Show, in charge of Pacific Coast Division, Silvertown Stores, has been attending a Goodrich retailing conference in Akron. The California factory is very busy, a considerable stimulus to production having been given by an aggressive sales and advertising campaign in the entire Pacific Coast field.

Davol Rubber Co., Providence, R. I., finds trade quite good on the Coast. According to W. J. Craft, manager of the Davol branch at 16 New Montgomery St., San Francisco, Calif., the only branch west of Chicago, the company's volume in the coast field has held up to within one per cent of 1929 figures despite greatly reduced prices. He states that the general trend in the druggists' sundries and surgical goods is gradually brightening, and there is every evidence that stocks in retailers' hands have never been so low as now. When general business quickens, the druggists' sundries field will be one of the first to respond to the forward impetus, he says.

J. M. Huber, Inc., manufacturer of carbon blacks, clays, and pigment colors, 460 W. 34th St., New York, N. Y., has announced the appointment of H. M. Royal, Inc., 4814 Loma Vista Ave., Los Angeles, Calif., as selling agent in southern California for Aeroflated Arrow carbon black and Aeroflated Suprex clay.

Claims Rubber Heel Invention

E. C. Critchlow, 2509 LaSalle Ave., Los Angeles, Calif., claims that he brought out and patented the first rubber heel in 1891, although the credit of priority has been given to others. He was then a resident of Meadville, Pa., and many years and half of his earnings were spent in trying vainly to market the heels that he had made. Objections were that they were dangerous; people might slip and break their necks; rubber heels could not last so long as leather; and wearers would be considered sneaky. Forty years ago, he says, only one letter-carrier was brave enough to use them. Now 250,000,000 pairs are made yearly in this country, and about 75 per cent of the new leather shoes are said to be fitted with rubber heels. When infringers cropped up in various parts of the country, Mr. Critchlow, unable to sue them, finally accepted a lawyer's offer to sell the patent to someone unknown for $250.

Quaker City Rubber Co., Philadelphia, Pa., notes that the Pacific Coast field is one of the first sections in the country to show a rally in trade; and according to Pacific Coast Manager J. T. Moore, whose headquarters are at 168-170 Second St., San Francisco, Calif., the company is now in a better position than ever to meet such expansion in business. Mr. Moore returned two weeks ago from a conference with executives in the Quaker City.

Goodyear Tire & Rubber Co., Los Angeles, Calif., has after a brisk summer business settled down to an average daily production of 6,000 tires, which amount is likely to be much increased by December when spring-dating business will start. The factory is running with its usual force, and some departments are being operated with three shifts daily. Leroy Tomkinson, vice president and general superintendent, has been attending the Goodyear company interplant conference held in Akron.

Pacific Coast Mechanical Rubbermen's Golf Association will have its annual tournament Monday and Tuesday, October 5 and 6, at the Rancho Country Club, near Los Angeles, Calif. Last year's tourney was held near San Francisco. The affair will conclude with a banquet. Assisting President W. Art. Corder are T. D. Horan, Harry Jensen, W. C. Hendrie, and F. L. Hockensmith. Twenty-two fine trophies have been donated by rubber companies in various parts of the country, and a big attendance is expected.

Lee Tire Co., Conshohocken, Pa., will supply about $50,000 worth of bus and passenger car tires for Los Angeles County, Calif., for the ensuing year. The contract has just been awarded by the supervisors to the Lee company's exclusive Southern California representatives, the W. B. Guyton Tire & Rubber Co., 1122 E. 8th St., Los Angeles, the lowest of many bidders. According to Mr. Guyton, whose concern owns one of the largest and most attractive distributing stations on the Coast, business is exceptionally good, each sales total for the past four months being higher than that of each preceding month.

L. H. Butcher Co., 2030-34 Bay St., Los Angeles, Calif., sole distributer of rubber manufacturers' carbon black made by the United Carbon Co., Charlestown, W. Va., reports the product in steadily increasing demand. It is stated, too, that sales of rubber chemicals and compounding ingredients generally are showing a noticeable improvement. The Butcher company maintains branches in San Francisco, Calif., Portland, Ore., and Seattle, Wash.

Pioneer Rubber Mills, San Francisco, Calif., reports business showing a better trend with demand improving for hose, belting, packings, mattings, etc., as well as for the reclaimed rubber for the making of which the company maintains at Pittsburg, Contra Costa Co., Calif., the original plant on the Coast. President Geo. S. Towne has recently been resting at his summer home, Lake Tahoe. K. E. Johnson, who had been purchasing agent, is now on the road as salesman, and the buying is done largely under the direction of Vice President H. R. Mansfield, who has been in charge of production for many years.

United States Rubber Co. reports that the tire output of the Samson Division plant in Los Angeles, Calif., in both unit and dollar sales has been running ahead of third quarter of 1930. General Sales Manager J. B. Magee is confident that during the remainder of the year the sales quota will be fully reached. Already the economies that were expected to follow the merging of the U. S. Rubber and Samson concerns are being fully realized. The factory is running three shifts a day, six days a week.

Firestone Tire & Rubber Co. of California is operating its Los Angeles factory on three shifts daily for a full week and has well caught up on production. A seasonal easing off on sales is much less than expected.

Tilley Mfg. Co., Inc., 744 Folsom St., San Francisco, Calif., maker of a wide variety of rubber mechanical goods, notes a considerable improvement in demand. President Edwin Tilley, who had recently undergone a severe operation, is again able to attend to the business.

Desser Tire Products, 4414 Long Beach Ave., Los Angeles, Calif., deals exclusively in rubber scrap.

The C. P. Hall Co., Los Angeles, Calif., reports that business is very active and that the outlook for the remainder of the year is excellent.

OBITUARY

An Early Believer in Hevea

COURTNAY DEKALB, internationally known mining engineer, scientific writer, and lecturer, and former trade commissioner for the United States Department of Commerce, died of apoplexy at Tucson, Ariz., September 2, aged 69.

Mr. DeKalb had taught mining engineering at the University of Missouri and later at the University of Alabama. In 1925 he lectured at Depauw University. He was one of the early contributors to INDIA RUBBER WORLD, writing a series of articles on Pará rubber forty years ago, the results of his studies in the Amazon country. He was an extensive traveler, one of his expeditions taking him through Brazil, Peru, Equador, Central America, and Mexico. As trade commissioner he investigated the mineral resources of Spain and Morocco.

Nearly twenty years ago Mr. De Kalb, deploring the fact that Americans had failed to take advantage of the collapse of the Brazilian boom and to make adequate provision for raising rubber abroad, thus avoiding dominance in such cultivation by far-sighted foreign interests, strove valiantly to arouse public sentiment in favor of establishing large overseas planting.

Failing in such worthy enterprise, he then urged the federal government to encourage the raising of rubber by Americans within their own boundaries, pointing out the possibilities of cultivating *Hevea brasiliensis* on a commercial scale in Florida and southern wastelands either with the original Brazilian tree or one or more obtained through hybridization or cross-fertilization, grafting, or budding. But Washington was too busy or unwilling to undertake such experiments.

Mrs. De Kalb, who survives her husband, has made some notable translations of Spanish classics.

Russell H. Baldwin

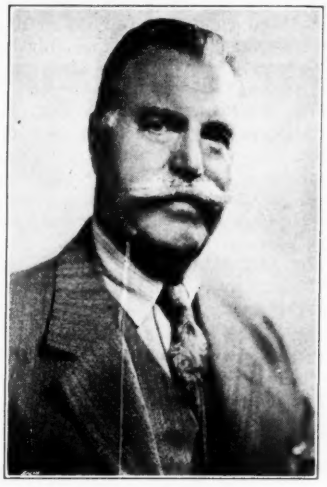
RUSSELL H. BALDWIN, former head of the Baldwin Rubber Co., Pontiac, Mich., after a long illness died at his home near Birmingham last month. He was 47 years old and had been connected with the Baldwin company until two years ago, when he retired because of ill health.

He was a member of the Detroit Athletic Club and Forest Lake Country Club. His widow and two daughters survive him.

George B. Campion

THE eastern district branch manager of The B. F. Goodrich Co., George B. Campion, died last month in the Medical Center, New York, N. Y., following an operation.

Mr. Campion was born in Louisville, Ky., February, 1886, and attended Manual Training High School. Between 1912 and 1915 he was employed by the Diamond Rubber Co., and thereafter joined the Goodrich organization with which he held various positions. He was appointed eastern district manager last February. Mr. Campion was widely known in the rubber and automotive industries.



C. Harold Smith

President of Binney & Smith

C. HAROLD SMITH, 71, president of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., and vice president of the Columbian Carbon Co., died of heart disease on August 31 while on a business trip in London, England. He was also a director in the L. Martin Co., Peerless Carbon Black Co., Magnetic Pigment Co., and Sebs Chemical Co.

Mr. Smith was born in London, January, 1860, and migrated to New Zealand when he was fifteen years old. When he came to this country in 1877, he established himself in the black industry.

Mr. Smith, who was also a biographer and writer of fiction, included among his works: "Rhawedia," "The Bridge of Life," "The Highway of Life," biographical sketches and suggestions for success. Among others he was a member of the Union League, Transportation, Uptown and Hudson River Country clubs.

He is survived by his widow, a son, a daughter, and a nephew. In his will Mr. Smith left the major part of his estate, which had decreased in size because of the fall in the stock market, to his family.

Interment was in Kensico, N. Y., on September 12.

Gilmer's Sales Manager

HIS hosts of friends will be shocked to learn of the sudden death from heart disease on September 17 of A. D. Quinn, sales manager of the Industrial Division, L. H. Gilmer Co., Philadelphia, Pa.

Mr. Quinn was born in Camden, N. J., January 13, 1887. In October, 1919, he became associated with Gilmer and in 1922 was placed in charge of the sales of the Industrial Division. Under his leadership this division showed phenomenal growth.

Anyone who was fortunate enough to have known A. D. Quinn intimately has been impressed with his willingness to help others, his genial and magnetic personality, and his devotion to duty. He is survived by his widow, a son, and a daughter.

Joshua Bowes

JOSHUA BOWES, formerly associated with the Lawrence Felting Co., Millville, Mass., founded by his father William, died at his home in Woonsocket, where he had resided for the past 15 years, on August 16 after a long illness. He was born in Millville, March 18, 1883, and was graduated from the Friends' School, Providence, in 1899. Shortly afterward he was employed in the Lawrence company a subsidiary of the United States Rubber Co.

He is survived by his wife, three children, two brothers and a sister.

Edwin B. Silliman

EDWIN B. SILLIMAN, 63, long connected with the rubber industry, died at his home in Nahant on August 26. Aside from the stores he owned and operated at various times in the East and the Midwest he was at times associated with C. M. Clapp & Co., and the United States Rubber Co.

Mr. Silliman was born in Hope, Me., and was educated at Chauncy Hall School. He is survived by his wife and a daughter.

Cremation at Mt. Auburn Crematory followed funeral services on August 27.

Southwest Firestone Battery Plant

To serve far western and trans-Pacific trade, Firestone Tire & Rubber Co. of California will make at Los Angeles, Calif., a full line of batteries, the same as now manufactured at the parent Firestone works in Akron, O., according to Vice President and General Manager R. J. Cope. About $200,000 will be spent on the new division, which will have a daily capacity of 1,200 batteries and employ about 100 men. Production may be started within two months.

Tornesit-Rubber Paint

It is known that by the reaction of chlorine on rubber solutions a product is obtained showing, among other remarkable qualities, great resistance to various chemical influences. So far, however, it has been impossible to manufacture a stable product. But the New-York Hamburger Gummi-Waaren Compagnie, Hamburg, has surmounted this difficulty and has built a factory where the product, named Tornesit, is obtained on a commercial scale.

Tests by the Propaganda Department confirm the findings of the Laboratory of the Mannesmannröhren-Werke, Dusseldorf, which carried out extensive experiments with Tornesit as an anti-corrosive paint, showing the extraordinary resistance of the material to chemical reagents, to a number of solvents, and to relatively high temperatures.

In 1931 the Propaganda Department organized large scale tests in Holland and will also investigate the possibilities of Tornesit in entirely different directions.

CANADA

A leading rubber footwear manufacturer states that he has just experienced the biggest tennis season in his company's history. In some sections rubber soled footwear was very scarce, both with retailers and in wholesalers' warehouses, because of the excellent demand this year. If Winter breaks early with snow and stormy weather, there will certainly be a large sale of protective footwear. Prices are lower than they have been for a number of years, and the values offered represent a high spot in footwear economy from the public's standpoint. Last year a big stock of odds and ends and holdovers in women's lines hung over the market, exerting a depressing influence. Much of this surplus now has been cleaned up, and the trade, in consequence, will be in a healthier condition.

No radical changes occurred in the new tennis ranges. Samples of some manufacturers are practically identical with their 1930 showing; others introduce new features, which for the most part include novel trimming. Sandals of awning cloth also are a feature.

Manufacturers of garden hose report decreased sales as the summer season is drawing to its close. A certain amount of sorting up business is being done by dealers, and prices remain unchanged.

Dealers are booking supplies of friction tire tape for fall and winter sales, and jobbers are quoting prices.

Rubber rings for preserving jars are in heavy demand this season of the year.

A reduction has been made in one make of tire patching outfits. Reduced prices have been issued lately on various rubber commodities in sympathy with the new low prices of crude rubber.

Dominion Rubber Co., Ltd., Montreal, P. Q., is showing several new styles in its lightweight all-rubber Gaytees. Three smart models are: Silhouette and Jiffy So-Lite in women's sizes, and So-Lite for misses and children.

Canadian Goodrich Co., Ltd., Kitchener, Ont., features among its smart new numbers the "Seville," a women's and misses' slipper in striped awning cloth with white sole, pneumatic heel, and adjustable T-strap. In addition to the stripes the "Seville" comes in five pastel shades in women's sizes only. The "Hawk" is a new model of the 1932 Zipps Sport Shoes, a super athletic shoe with six outstanding features.

Gutta Percha & Rubber, Ltd., Toronto, Ont., among new models shows a smart sandal featured in Trinidad duck, with crepe sole and wedge heel in women's, misses' and children's sizes; also with rubber compound sole, cuban heel, for women only.

Miner Rubber Co., Ltd., Granby, P. Q., is offering to the trade an assortment of rubber soled canvas footwear that will carry a strong consumer appeal. New designs in beige and tan two-tone effects and in fancy printed canvas contribute to the smart, pleasing appearance of: Margy, a sport tie for misses and children; Admiral in men's beige canvas oxford; Pastime, for boys and misses; and Dorcas, a women's oxford in beige canvas.

The Woodstock Rubber Co., Ltd., Woodstock, Ont., issued its first catalogue, a very attractive publication covering a complete range of Woodstock products, as a further step to meet present needs of the dealer for the best possbile in-stock service.

The Dill Mfg. Co. of Canada, Ltd., Toronto, Ont., manufactures and sells convertible truck and bus valves, approved recently by the Tire & Rim Association of America. The company also markets a new valve converting tool especially designed for bending convertible truck and bus valves into any of the required types.

LEGAL

Drawbacks

Tires. (T. D. 45,042-L.) Manufactured by the India Tire & Rubber Co., Mogadore, O., with cotton fabric produced under drawback regulations with the use of imported long staple cotton.

Rate effective on tires manufactured and exported on or after March 1, 1931. *Treasury Decisions,* Vol. 60, No. 4, pp. 15-16.

Tires. (T. D. 45,107-Y.) T. D. 45,042-M, of July 10, 1931, authorizing the payment of drawback on tires manufactured by The B. F. Goodrich Co., Akron, O., with cotton cord manufactured under drawback regulations from imported long staple cotton, *extended* to cover the same articles by the Pacific Goodrich Rubber Co., Los Angeles, a subsidiary.

Extension effective as to tires manufactured and exported on or after March 13, 1931. *Treasury Decisions,* Vol. 60, No. 10, p. 34.

Tires. (T. D. 45,107-Z.) Manufactured by The Goodyear Tire & Rubber Co., Akron, O., with cotton fabric produced under drawback regulations with the use of imported long staple cotton.

Rate effective on tires manufactured and exported on or after April 1, 1931. *Treasury Decisions,* Vol. 60,No. 10, pp. 34-35.

Customs

Rubber tube with bulb (trick plate lifter). T. D. 45,124 (4). The article consists of a rubber tube 6½ feet long with a rubber bulb 1 inch in diameter at one end and a rubber bladder one-half of 1 inch in diameter at the other end; it is a trick plate lifter chiefly for use at banquets in playing jokes.

Held properly dutiable as a manufacture of rubber, not specially provided for, at the rate of 25 per cent ad valorem under paragraph 1537 (b) of the tariff act of 1930. Letter to appraiser of merchandise, Philadelphia, Pa., dated August 28, 1931. *Treasury Decisions,* Vol. 60, No. 11, p. 14.

Northern Electric Co., Ltd., Montreal, P. Q., announces Flexible Cords equipped with soft rubber plugs for all purposes, which, it is claimed, are unbreakable, self-alining, and trouble-proof.

Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont. For the second time within a year Montrealers were offered the opportunity to see the giant Firestone Ford tri-motor plane on its annual Canadian goodwill tour, the object of which is to increase the popularity of aviation. Free rides were a feature during its stay in Montreal. Among those who flew to Montreal from Ottawa were E. W. BeSaw, president of the Canadian company; J. A. Livingstone, trades sales manager; Russell T. Kelley, advertising counsel for Canada, et al.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., is introducing to the Canadian trade the Dunlop tennis racket. L. E. Levy has been appointed manager of the Dunlop branch in London, Ont., to succeed J. Mortimer Hunt, who died suddenly some weeks ago. Mr. Levy formerly was connected with Dunlop's head office in Toronto, Ont., and for the past twenty-one years has been associated with the Dunlop people. He was at one time assistant sales manager of the company's mechanical division, and also sales manager of the tire division.

R. W. Richards has been appointed assistant general sales manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont. Mr. Richards was formerly manager of tire sales, and has been associated with Goodyear for twenty years.

Produced-in-Canada Exhibition. The third annual national produced-in-Canada show will be held in Montreal from November 2 to 7. It is said to be the outstanding exposition of exclusively Canadian-made products and is the second largest industrial display in the Dominion.

Canadian General Electric Co., Ltd., recently appointed Leslie D. Carver rubber chemist at its Peterboro, Ont., works. A graduate of the University of Toronto, his experience as rubber chemist and engineer includes six years with Gutta Percha & Rubber, Ltd., Toronto, and four years with Seiberling Rubber Co. of Canada, Ltd., latterly as production control manager of the Toronto plant. His present position with Canadian G. E. is a natural development of the company's increasing use of rubber, not only as insulation for electric wires, but also in various forms in many other products.

Percy Hermant, Ltd., Toronto, Ont., has added to its products a new and, it is claimed, improved type of trouble lamp and plug. Both items are of soft rubber, and it is understood that this is the first time such articles have been made in Canada.

Kelton Elastic Products, Ltd., Toronto, Ont., changed its name to Waring Products, Ltd.

Rubber Industry in Europe

GREAT BRITAIN

Dutch Restriction Plan

Although the British are getting rather weary of the endless plans by the Dutch for restricting rubber, the latest scheme from Holland is receiving some attention.

The most striking feature of the new rubber quota scheme which the "Verubo" (Rubber Producers Association for Regulating Output) has submitted to the Dutch Minister for the Colonies is that the market must remain free and a price regulating policy cannot be fixed. It is, in fact, primarily concerned with stocks. As the originators of the scheme put it, the ship is too heavily laden and, therefore, threatens to sink. The load must be lightened to keep the vessel afloat and save it from destruction.

The plan, which is provisionally suggested for three years, provides that each of the producing countries, Malaya, Ceylon, and the Netherlands East Indies, shall have a basic quota for twelve months, after which it is to be revised to conform with the changed rational capacity of the three territories.

To begin with restriction of 25 per cent is suggested, though this might have to be increased right from the start or later on. In any case the quota for the native producers in the Dutch East Indies is not to be less than 90,000 tons, an amount slightly above their total exports during 1930. This is to insure that their standard of living remain the same as in that year; so no cause for dissatisfaction attributable to restriction would arise among the natives, a matter of great importance.

1929 production would serve as the basis for the quota for the first twelve months, the native producers in the Dutch Indies being allowed an extra 11,000 tons to bring their fixed quota to 90,000 tons. With 25 per cent restriction, approximate figures follow:

	1929	1930	25% Restriction
Malaya	442,600	434,000	331,950
Ceylon	75,000	75,000	56,250
Netherlands East Indies			
Estates	151,000	152,000	
Natives	108,000	89,000	202,500
Quota allow'ce.	11,000	.....	
Total tons ...	787,600	750,000	590,700

Regulation of outputs would be effected by production licenses, permitting free export, issued to all estates and to native owners in Malaya and Ceylon, and by export licenses to native owners in the Dutch East Indies. The production licenses would be negotiable so that companies with high production costs could sell their licenses to cheaper producers. The companies would have to bind themselves not to produce more rubber than the licenses they hold cover. For the natives the exports allowable would be fixed monthly or quarterly. It is recognized that the distribution of export licenses among the natives would meet with some difficulties, but these are not insurmountable.

In a letter to the *Financial Times*, J. E. Nathan, commenting on the new Dutch rubber plan, points out a weakness in suggesting restricting the natives. He says that restriction of exports necessarily involves the allocation of the restricted amount to individual producers, and this is impossible unless accurate data of individual holdings are available, which is not the case. If the licenses were issued to the Chinese buyers of native rubber or exporters at the ports of Sumatra or Borneo, this condition would put the natives at the mercy of the Chinese so that some natives might be able to sell all their rubber, and others not a pound. Mr. Nathan, therefore, suggests that instead of issuing export licenses, a tax in kind should be levied on Dutch East Indian native rubber at the port of export and that the rubber collected in this way be destroyed.

Why the Dutch Will Not Restrict

Although it is understood that British shareholders in rubber estates on the whole regard the Dutch with much suspicion and that their feelings have not been improved by all the schemes that have been started by the Dutch only to be abandoned, it is seldom that one comes across anything quite so outspoken as the statements made in a recent letter to the *Financial Times*. The writer asserts that the Dutch considered the whole position long ago and finding that the British had about £200,000,000 invested in rubber and controlled 75 per cent of the world output, whereas they had £60,000,000 and produced about 25 per cent, they decided that it would pay them best to reduce all this capital, British and Dutch, to about half by allowing the natives to plant up thousands of acres of unwanted rubber. They would thus become as big producers as the British at a cost to their shareholders of about £30,000,000 and to the British of £100,000,000, on equal production.

"This may be the reason why they do not favor restriction," he adds. "This may be good finance for them, but as the British would be losing. £100,000,000 of their capital, this view should not be lost sight of, and measures must be taken to prevent it.

Rubber Technology Courses

The Technical College, Aston, Birmingham, has opened a new department devoted to rubber technology, and thus becomes the only college in the Midlands doing this kind of work. The courses, given in the evening, are intended for both technical and non-technical students. Two types of courses are, therefore, provided, under the control of specialists from the industry. One course gives general information which salesmen and commercial staffs would require and includes a general survey of the industry, including plantations, characteristics of raw rubber, vulcanization, uses of rubber, essentials regarding compounding ingredients, perishing of rubber, etc. No advanced knowledge of chemistry or physics is required of students in this class.

The technical courses, on the other hand, will enable students to sit for the Licentiateship and Associateship examinations of the Institute of the Rubber Industry. Classes are provided in rubber chemistry and in the physical properties of rubber materials, and a number of problems connected with rubber are considered. Much technological ground is also covered, and advanced practical chemical and physical testing of rubber is carried out by the students. The work prepares them for management, scientific control, or research work.

Lectures on Rubber

Eighteen lectures, delivered on consecutive Tuesdays, starting September 22, are being given by the City of London College in connection with the Eighty-fourth session of the Department of Commercial Products. Twelve lectures on "Production and Consumption of Rubber" will be given by George Rae, of Harrisons & Crosfield, Ltd.; two lectures on "Marketing Rubber" by C. Kraay, of Hymans, Kraay & Co.; and four on "Character, Grades, and Defects of Raw Rubber" by W. H. Stevens. At the conclusion of the course an examination will be held, and short course certificates will be awarded to successful students. A prize of five guineas (£5 5s.) offered jointly by the Rubber Trade Association of London and the Rubber Growers' Association, will be awarded to the student with the best results on the examination.

New Process for Making Tire Cord

The *Rubber Age* of London publishes some details regarding the new two-twist process for making tire cord developed by the Dunlop Rubber Co., Ltd. The process, as explained by a Dunlop official in an interview, puts two twists, instead of one, in the thread for each turn of the spindle. This discovery is not entirely new, but up to recently it could not be worked satisfactorily because it was impossible to prevent the spindle from oscillating. This difficulty has now been overcome, and the new process yields a better controlled yarn. There is no limit to the amount of twist that can be imparted to the yarn, and greater control of elongation is obtained. The production of tire yarn by the new process, which gives much greater resistance to fatigue, is exclusively Dunlop. The firm has such faith in it that it has already installed fifty machines for the process in its cotton mills at Rochdale, and 20 per cent of the total plant is working on it, while it is planned to extend the system throughout the mills.

Road Experiments

The Clydebank town council has had a patent rubber-tread non-skid footpath laid in Kilbowie Hill. The footpath, which takes the place of a concrete one, extends for 180 yards over a section having an incline of 1 in 10. The rubber treads have been supplied by the Shap Granite Co., Westmoreland, and are said to be of reenforced rubber, 2 inches thick cut into squares of various sizes, and laid on a bed of broken cement, bricks, ashes, and sand.

A second experiment has been conducted in Burton-on-Trent outside the British Goodrich Rubber Co. works, over a road surface 100 yards by 4 yards. The material here used consisted of a mixture of 10 per cent of rubber chippings from old solid tires, and 90 per cent granite chippings, the whole bound by tar. The system is one contrived by John A. Ross, of Stapenhill, who cut all the rubber used in the experiment by hand with a knife. He states the road will have to endure five months of traffic before its qualities can be judged.

Company Notes

Redfern's Rubber Works, Ltd., Hyde, Cheshire, has installed a new plant and enlarged its rubber flooring department to meet the growing demand for rubber flooring.

Macinlop, Manchester, has secured what is said to be one of the largest rubber flooring contracts ever given, running into several thousands of pounds sterling, for the new headquarters of Martin's Bank, Liverpool. Macinlop was also asked to do the rubber tiling for the bathrooms in Mansion House, the official residence of the Lord Mayor of London.

Ioco Rubber & Waterproofing Co., Ltd., Glasgow, has acquired all the buildings and the entire plant and machinery formerly owned and occupied by the Ancoats Vale Rubber Co., Ltd., Ancoats, Manchester.

Leyland & Birmingham Rubber Co., Leyland, Lancashire, pays no dividend on its common shares over the year ended June 30, 1931. Last year the dividend was 7½ per cent, and the year before 12½ per cent, while £15,000 was put to reserve.

The India Rubber, Gutta Percha & Telegraph Works Co., Ltd., on September 1 transferred its head office and London branch to Aldwych House, Aldwych, London, W.C.2.

SWITZERLAND

The use of rubber tires is increasing in the most unlooked-for directions. Some time ago it was noted in these columns that at an agricultural exposition in Germany, light hand carts with rubber tires were shown for house-to-house delivery of milk. Now comes the news that the Swiss postal authorities for the past few years have been replacing the heavy old-fashioned wooden carts used for delivering mail by light hand carts of steel and metal equipped with pneumatic tires. The change has effected much greater efficiency.

GERMANY

Import and Export Statistics

Considering the general situation, it is not surprising that statistics for Germany's rubber trade during the first half of 1931 show a decrease on every side. Thus imports of raw rubber fell from 272,788 quintals, value 42,233,000 marks, to 233,029 quintals, value 19,467,000 marks; exports of rubber goods, in 1930, were 112,212 quintals, value 59,037,000 marks, but dropped to 96,015 quintals, value 45,288,000 marks; while imports of rubber goods, which had amounted to 39,550 quintals, value 19,331,000 marks, declined to 26,897 quintals, value 12,651,000 marks.

Among the imports of manufactured rubber the only item worth mentioning that shows an increase is rubber thread, rising from 1,725 to 1,784 quintals. The increase was almost entirely due to larger shipments from Great Britain. Imports from the United States, never great, were reduced to almost a quarter.

Drastic declines are noted in the imports of tires and tubes of all kinds. Thus automobile tire covers numbering 172,208 in the first half of 1930, were 117,470 in the period under review. Belgium ranked first, with 35,910 instead of 44,557 tires, taking the place of America which was represented by 29,160 tires instead of 54,557. Italy was third with 25,908 against 31,427. The drop in imports of covers for bicycle tires was even more marked, from 210,375 to 79,490; Belgium and France suffered heavy setbacks, the former from 117,542 to 11,492 and the latter from 69,301 to 26,924; Italy climbed to first place with 33,113 against 20,910.

Inner tubes for automobile tires were only 65,415 against 106,310. Belgium retained her lead in this article but shipped 24,093 instead of 28,755. The United States lost the most ground here, for although remaining second on the list, its share dropped from 27,140 to 11,616. Great Britain, on the other hand, booked the only increase, from 6,052 to 8,395. Imports of inner tubes for cycle tires, which fell from 124,856 to 40,199, were chiefly supplied by France and Belgium.

Foreign competition in footwear is keener than that in tires and tubes. Here too the total decreased from 311,440 pairs to 223,161 pairs, but some of the regular suppliers were able to show larger shipments. Thus America sent 74,444 instead of 41,639 pairs; Latvia, 55,126 instead of 52,948 pairs; and Austria, 20,016 instead of 18,346 pairs. However, against these figures there are substantial declines from Denmark and Sweden and also from the more recent sources of supply, Russia and Czechoslovakia. Canadian shipments likewise declined sharply.

Under mechanical goods, imports of belting increased from 407 to 429 quintals. The United States, which usually supplied the greater part of these goods, had to cede its place to Great Britain. Packing fell from 406 to 145 quintals, and the share of the United States from 330 to 78 quintals. A similar trend is noted in hose, which was 183 instead of 248 quintals. The United States supplying 49 instead of 132 quintals.

Among the exports two items draw attention: footwear and tubes for cycle tires, both of which increased, the former from 711,632 to 893,209 pairs, and the latter from 1,309,436 to 1,314,593. Great Britain is Germany's outstanding footwear customer, followed rather modestly by the Netherlands. These two countries, besides Denmark, also figure prominently as buyers of German tubes for cycles. Exports in covers for cycle tires dropped from 604,981 to 512,133; the largest quantities went to Denmark, British India, and the Netherlands East Indies. Exports of automobile tire covers suffered severely, the decline being from 155,485 to 84,857, some of Germany's best markets, as British India, Argentine, Czechoslovakia, showing the greatest drop. Exports of automobile tubes fell from 129,091 to 61,175.

Belting dropped from 2,459 to 1,577 quintals; packing from 1,722 to 876 quintals; and hose from 11,471 to 7,184 quintals. France and the Netherlands are Germany's best customers for packing and hose, the former especially for hose and the latter for packing; but in 1931 both countries cut their purchases drastically. Elastic goods exports were fairly well maintained, but a sharp reduction in shipments to Great Britain decreased the total from 9,646 to 8,522 quintals.

An examination of origins and destinations of the goods coming into and leaving Germany shows that that country does the most business in rubber goods with Great Britain; Belgium now takes first place as supplier of tires and tubes, and America as source of footwear; this country, however, is apparently losing its place to Great Britain, as chief supplier of mechanical goods. Of the other countries with which Germany has dealings, the Netherlands may be considered the best all-round customer; outside of Europe, British India and Argentine figure prominently as good markets.

French Chemical Apparatus Exhibits

The results attained by the Achema, Exhibition for Chemical Apparatus, which for the last ten years has been organized by the Dechema, German Society for Chemical Apparatus, led to a similar exhibition in London from July 13-18, 1931. Now France is considering organizing a like exposition to be held in Paris in 1932. It is learned that the Société de Chimie Industrielle has suggested to the Achema that the exhibitions be held alternately in each of the three countries, France, England, and Germany. This proposal was duly considered by those interested and accepted. So that in all probability an Achema will take place in France in 1932, while the Achema VII will be held for Germany in Cologne in 1933, and a similar exhibition is in prospect for London again in 1934.

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Hevea Seed Data

At a recent conference in Bandoeng of the Soekaboemi & Planters' Association, D. J. N. van der Hoop reported his findings on Hevea seed, seedlings, and buddings. On his estate detailed records are kept of seeds, including date of pollinations, time required for seed maturation, and weight and content of seeds from each tree.

The period of seed maturation has been found to vary considerably for different clones. The effect of this variation on the quality of the seeds is not known yet. The period of germination also varies between 14 and 29 days. Since 1930, seeds taking over a month to germinate are cleared out.

Tests have been undertaken to determine whether the seed of buddings is inferior to that of seedlings, but the results cannot yet be discussed. The percentages of germinations of seed from buddings are certainly not lower than those from their mother trees.

It is remarked that the percentage of unsound and non-germinating seeds from budded trees increases considerably during dry weather. One clone on van der Hoop's estate at all times gives a high percentage of unsound seeds. The seed from the mother tree of this clone, however, is perfectly normal though it has been observed that the tree itself is sensitive to dry weather, a circumstance that is reflected in its latex yields.

An interesting fact is that on the whole the percentage of unsound seeds in buddings is very much higher than in the case of trees that have not been budded, and that the first crop of seeds from young budded trees is always largely unsound and has poor germinating powers. The clone mentioned above as yielding much unsound seed is, as it happens, of no value as a producer of latex, but oddly enough some very good high yielding trees have been obtained from its seed. A poor clone may, therefore, be able to produce good offspring.

A fact worth noting is that mildew attacks on the blossom, the stalk of the flower, and perhaps even of the leaves, adversely affects the germinating powers of seeds from buddings. As nothing of this is found in seeds from seedlings, unless in exceptional cases, it is suggested that something is amiss with the internal vital functions of buddings. The percentage of non-germinating seed and unsound seed in the case of clones may, therefore, in future be found to bear a direct relation to the value of the clone and is consequently, an important factor.

In connection with the susceptibility of seeds from buddings to dry weather, a test was made to determine the hygroscopy of rubber from eight different clones. This rubber was in the form of pieces of crepe, weighing 50 grams each, which were weighed at different periods of the day during 100 consecutive days, and curiously enough the rubber that was most affected by the dry weather came from the clone that has already been mentioned as yielding an unusually large percentage of unsound, spongy seed.

Nursery Plants

Van der Hoop states that good soil is not essential for growing plants to be budded later on. In fact poor soil is better since weak plants cannot exist in it and quickly die, leaving only the strongest as survivors. But even after the best plants have been chosen from among those left after the natural selection, and have been budded, about 20 per cent still have to be rejected because of faulty root formation discovered later on. This disclosure indicates that one cannot be too careful in selecting good seed for growing plants that are subsequently to be budded if waste is to be avoided; this, especially when it is further considered that some buds are particularly sensitive to the stock on which they are grafted and that this sensitiveness reduces the number of successful buddings.

In an experiment 44,669 buds were grafted, 60 per cent were successful, the best stock giving 80 per cent and the worst 30 per cent. When the results were further analyzed, it was found that most success had been obtained with bud wood taken from mother trees, and the least with material taken from clones. Since this revelation appears to indicate progressive degeneration in the clones and might eventually be found to affect the flow of the latex, an experiment is to be conducted in which buddings made with material taken directly from mother trees will be compared with buddings from fourth generation bud wood.

Economic Side of the Question

The comparative cost of raising seedlings and buddings was also figured. The average cost per stump, of seedling, was 5.5 cents (guilder cents) each; whereas for the buddings it was 17.1 cents each. It now remains to be seen whether the extra costs will be justified by the future performance of buddings.

High Budding

The question of placing buds high up on 3- to 4-year-old stems instead of budding low on young plants of from 8-9 months or a year is now receiving attention both in the Dutch East Indies and in Malaya. Van der Hoop also reported on the results of tapping high buddings and the stems on which they were grafted.

The 3- to 4-year-old stems were budded in 1923, and preliminary tapping tests occurred in 1927. The buddings, however, were too young; so further tests were made in 1928. In one series of tests the trees were tapped with one cut 50 cm. above the junction of bud and stock, and one cut at 25 cm. below the junction. As the simultaneous tapping of both parts seemed to affect adversely the flow from the upper cut, some trees in this test were put to a second test where tapping was done on upper and lower cuts alternately. A third test called for three cuts per tree, one 50 cm. above the junction of bud and stock, one 50 cm. below the junctions, and one 50 cm. above the root collar, only one cut tapped a day.

Results of Experiments

The results of the experiments showed that:

In the great majority of high buddings the stem of the stock yields more latex than the upper bud stem although some buddings can maintain their superior output capacity.

Since the average yields obtained from the upper stem in these high buddings practically run parallel with those obtained from other buddings of the same age from the same mother trees, the high yields from the lower stem must be regarded largely the result of the effect of the budding operation itself, and is thus an additional gain due to this operation.

The growth factor in high buddings predominates over the original production factor. The total output from the lower stem has been found to be about 2½ times as high as that from the upper stem. The results seem to indicate that high budding gives an added advantage in respect to yield and that the factors that will have to be studied here are the origin of the lower stem and the mutual influence of upper and lower stems in increasing yield capacity. As the speaker said in his conclusion, an entirely new field for investigation is herewith opened, and the application of the system may offer very far-reaching possibilities in the rubber planting industry.

SHANGHAI

The Rubber Trust, Ltd.

A group of Shanghai merchants has organized the Rubber Trust, Ltd., with a nominal capital of 25,000,000 taels (tael = about $0.27). The aims of the company include purchasing for cash or by exchanging shares, securities, and shares of approved companies already in existence; making loans to rubber plantations; underwriting new plantation issues; and amalgamating groups of rubber estates. Many companies producing rubber have difficulty in meeting management expenses, and the trust hopes to find employment for its capital in loans to such estates.

MALAYA

Less Tapping Does Not Reduce Yields

The question that intrigues the outsider is why, with all the announcements of partial or complete cessation of tapping the total shipments from producing centers show no signs of decreasing. It is generally supposed that, not considering the native element, the work of the more sensible estates is nullified by the ruthless tapping going on where capacity production is the rule. To a certain extent this supposition is correct. But on the whole the modern planter has learned too much about the reactions of Hevea trees to different methods of treatment to tap blindly and excessively. That the results of careful scientifically planned tapping methods in the end amount to the same thing as far as yields are concerned is another matter.

The point to be considered is that whether a planter taps full out or only on part of the estate, his aim is to get the best crop at the lowest costs. When estates reduce tapping programs, they do so not from a desire to reduce outputs to save the industry, but to cut costs to save themselves. So their problem is to obtain the best crop from the smallest area and with the lowest costs of tapping, preparation, supervision, etc. Therefore, if an estate reports it is tapping only half its tappable area, this does not mean that the output will be reduced by half, nor anything like it. The half area left untapped includes the youngest, the least productive, the least accessible, the poorest lands, which probably yield only 25 per cent, if not less, of the total output.

If an estate reports more conservative tapping methods are to be employed, with longer periods of rest, again the output may remain practically unaffected. In the first place if a smaller area is tapped, it is possible, if the number of tappers is not too greatly reduced, to finish tapping earlier in the day and thus increase the crop per unit of area; on the other hand, rest is something to which the Hevea responds by giving greatly increased yields.

Estate Planting Policies

The number of estates where selective tapping and voluntary restriction are in force is fairly large, indeed if reports of a number of companies published in recent issues of the *Straits Budget* are to be regarded as representative, more of the better class of estates are restricting tapping than are those producing all out. Thus out of 21 estate reports 11 showed that part tapping, selective tapping, or more conservative tapping methods had been adopted or were to be followed; 2 estates had been out of tapping for over six months; and 2 more were going on a care and maintenance basis; 1 had delayed tapping young rubber; 4 were tapping full out; 1 reported a restricted crop larger than the output of the year before.

We may here have to do with a misprint. But if the restriction merely meant that tapping on young areas had been deferred, the increase could have been obtained on the older section because of better methods of tapping and cultivation, or just simply as a result of the natural increase of yield of areas that have not yet reached the maximum yield capacity.

With rubber prices what they are undoubtedly more estates will go on a care and maintenance basis, and these will by no means be the weakest estates. Among the four estates mentioned as having suspended tapping is the Bradwell (F. M. S.) Rubber Estate, Ltd., a company with a strong financial position which says about tapping at present.

"Turning now to the planting side of our business, that unfortunately is not so satisfactory as our finance. Last July we were able to reduce our staff by placing our senior assistant on a neighboring estate and shortly afterwards by adopting a more conservative system of tapping we were able to dispense with a junior assistant. That left our manager with only one assistant on 2,915 acres of rubber.

"But even so when the price of rubber fell below 3d. in April, it became clear that our wisest policy would be to take advantage of our strong financial position to conserve our bark and cultivate our young areas rather than to continue tapping and producing at a loss. Accordingly instructions have been given for all tapping to stop at the end of this month, and our crop for the year will not amount to more than 260,000 pounds of which 224,100 were harvested up to the end of May."

The Nordanal (Johore) Rubber Estates, Ltd., has been considering suspending tapping as under present conditions and in spite of the most rigid economies there is little or no difference between the loss incurred by continuing to tap and that which would result from putting the estate on a care and maintenance basis. However, since it has taken the estate many years of expenditure and hard work to build up the labor force, and the estate is isolated, it has been decided that rather than disband the labor force and run the risk of future difficulties and expense in gathering labor together again when prosperity returns, a modified tapping program on half the estate is to be followed.

Here is an important cause for continued tapping—the reluctance to discharge a trained and established labor force because of the risk it involves of trouble and expense when better times return.

The Bukit Rajah Rubber Co., Ltd., is another concern which apparently believes in preparedness and in making use of its satisfactory financial position to extend its bud-grafted area. The estate has for some time been conservatively tapped, never more than two-thirds of the estate being in tapping at the same time, and it is now changing to a still more conservative method: namely, alternate daily tapping on half the estate for nine months, when the other half will be brought into tapping and the first half rested.

The Punggor Rubber Estates, Ltd., has suspended tapping over the entire area and reports that it has funds available to keep the estate on a care and maintenance basis for about three years if necessary.

Of the 21 estates considered, 4 reported a small profit and 1 exhausted funds.

Malayan Rubber in 1930

According to the report on agriculture in Malaya in 1930, by H. A. Tempany, the total area under rubber in this colony was 2,937,670 acres at the end of the year. The total production of rubber was 451,864 tons, of which small holdings are estimated to have produced 215,089 tons. At the same time the Dutch East Indies produced 270,000 tons, and Ceylon 75,000 tons. Despite the slump new plantings in Malaya during 1930 are estimated at 20,193 acres. On the whole the larger estates maintained a normal standard of upkeep although toward the end of the year field work was to a certain extent curtailed.

Interest in budded rubber continued, and budwood was still imported from the Netherlands East Indies though the quantity was less than in 1929 partly because of the increasing production of budwood locally and partly for financial reasons. The total area planted with budded rubber in the Straits Settlements and the Federated Malay States at present is estimated at about 75,000 acres. Large areas have also been budded in Kedah and Johore. Several new clones of great promise have been discovered. Many estates are now ready to plant blocks of single clones which have sufficiently good records. Most planters, it appears, are now convinced of the value of bud-grafting, and a certain interest is also being manifested in the high budding of 2½ to 4 year-old stock, certain small areas having been budded at 18 inches and higher.

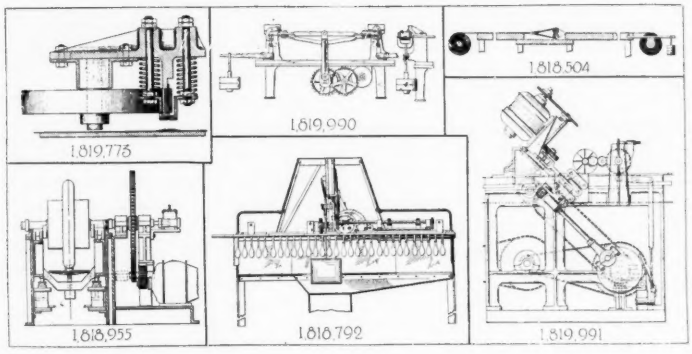
With regard to soil management and conservation, present practice on the whole seems to favor pitting and bunding combined with clean weeding, instead of the establishment of cover crops. It is questioned whether heavy cover crops do not cause a decrease in the latex yields, and this point is to be investigated. Investigations in relation to estate factory practice have demonstrated the possibility of increasing the output of sheet rubber by using wide roll light machines and deep coagulating tanks. On several estates a light battery of three smooth roll and one marking machine has raised the output to 1,200-1,300 pounds of dry rubber per hour against an average output of 400-500 pounds per hour obtained with the usual machines in the best factories. The handling of coagulum from the coagulating tanks without preliminary rolling has been effected by suitable aluminum chutes.

An investigation of latex resulted in the isolation of a lipin body which appears to be important not only in connection with the rate of cure, but also seems to be closely related to the variability in plasticity of plantation rubber.

Rubber Estate Bargain

That some estates are severely feeling the pinch of present conditions is evidenced by the news that the assets of the Pulau Bulang Rubber & Produce Co., Ltd., including 3,500 acres planted to rubber, were sold at auction in Singapore for $5,200 (Straits currency).

Patents, Trade Marks, Designs



Machinery

United States

1,818,504.* **Separating Sheet Materials.** This machine overcomes the adhesion of tacky sheet rubber when rolled in a cloth liner, and by a novel device quickly separates the rubber sheet from the fabric liner without damage to either of them. F. B. Pfeiffer, Akron, and J. W. White, Barberton, O., assignor to the Seiberling Rubber Co., a corporation of Del.

1,818,792.* **Form Stripper.** The action of this machine is to strip dipped rubber goods such as balloons, etc., from the forms on which they are dipped and cured. The stripping effect is accomplished by forcing water between the form and the rubber articles to loosen their adhesion, followed by pulling off action of moving pads contacting with the goods. R. E. Coovert and L. W. Wilkinson, both of Willard, O.

1,818,955.* **Tire Making Machine.** This machine is designed to perform the various steps involved in the assembly of the parts of pneumatic tires. This assemblying is done by a group of devices arranged and connected in a train with means for moving the tire cores from one device to the next in the series as the make-up of the tire progresses step by step. E. F. Maas, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,819,773.* **Fabric Cutter.** It is an improved feature for attachment, as an improvement, to the same inventor's previously patented bias cutter. The improvement relates to special means for insuring a straight cut of the fabric. H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,819,990.* **Tester.** This relates to machines for testing rubber shock insulators used on automobile springs in place of shackle bolts. It also provides means for applying to the insulator being tested a load equivalent to the weight of an automobile. W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

* Pictured in group illustration.

1,819,991.* **Band Cutting Machine.** Means are provided for cutting bands of tough rubber, fabric, or like composition and making a true skived edge on the material. The machine also automatically and accurately gages and cuts uniform lengths of the strip or band. W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,816,494. **Annular Article Buffer.** E. D. Putt, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,816,505. **Engraving Machine.** C. Uschmann, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,816,883. **Door for Sealing Vessels.** H. Willshaw, Wilde Green, W. G. Gorham, Erdington, and E. Ramsbottom, Heywood, assignors, by direct and mesne assignments, of one half to Dunlop Rubber Co., Ltd., Erdington, all in England.

1,817,515. **Collapsible Core.** F. L. Johnson, Akron, O.

1,817,929. **Fabric Slitter and Strip Edger.** F. B. Pfeiffer, Akron, assignor to Seiberling Rubber Co., Barberton, both in O.

1,818,372. **Air Cell Impregnated Rubber.** S. Battilani, New York, N. Y.

1,818,710. **Air Tube Reenforcer.** M. S. Hannon, assignor to Hannon Tire & Rubber Co., Ltd., both of Toronto, Ont., Canada.

1,818,766. **Sectional Repair Bag.** C. J. Smith, G. K. McNeill, and C. J. Dolding, assignors to Morgan & Wright, all of Detroit, Mich.

1,819,032. **Inner Tube Machine.** P. W. Lehman, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,819,033. **Feeder and Cutter.** P. W. Lehman, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,819,046. **Fabric Cutting Machine Gage.** M. F. Sullivan, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

1,819,747. **Tire Bead Reenforcer.** C. C. Harrah, assignor to National-Standard Co., both of Niles, Mich.

1,819,986. **Rubberized Fabric Apparatus.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,819,988. **Mill Roll Cooler.** R. R. Jones, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,819,989. **Winder and Reeler.** W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

Dominion of Canada

313,699. **Sponge Rubber Receptacle Apparatus.** W. Vernet, New York, N. Y., U. S. A.

313,792. **Grinder.** Intercontinental Rubber Co., assignee of G. H. Carnahan, both of New York, N. Y., U. S. A.

314,006. **Valve Stem Inserting Tool.** Goodyear Tire & Rubber Co., assignee of F. J. Houck, both of Akron, O., U. S. A.

314,007. **Pneumatic Tire Bead Apparatus.** Goodyear Tire & Rubber Co., assignee of W. E. MacMonagle, both of Akron, O., U. S. A.

314,008. **Braiding Machine.** Goodyear Tire & Rubber Co., assignee of G. D. Mallory, both of Akron, O., U. S. A.

314,011. **Treating Rubber Compounds.** Goodyear Tire & Rubber Co., assignee of R. W. Snyder, both of Akron, O., U. S. A.

314,013. **Tire Flap Brander.** Goodyear Tire & Rubber Co., assignee of R. M. Johnson, both of Akron, O., U. S. A.

314,273. **Processing Apparatus Cycle Controller.** C. J. Tagliabue Mfg. Co., Brooklyn, assignee of F. J. Bast and L. C. Irwin, co-inventors, both of New York, all in N. Y., U. S. A.

314,498. **Vulcanizing Apparatus.** B. Griffith, Wallasey, England.

314,589. **Tire Shaping Machine.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. L. Heston, Columbiana, O., U. S. A.

United Kingdom

348,566. **Dipping Hollow Articles.** C. J. Schmid, Inc., New York, N. Y., U. S. A.

348,853. **Airbag Remover.** Dunlop Rubber Co., Ltd., London, H. Willshaw and L. S. Blanchard, both of Ft. Dunlop, Birmingham.

349,021. **Boot Vulcanizer.** C. H. R. Collins, Edinburgh, Scotland.

349,062. **Porous Rubber Compositions.** Dunlop Rubber Co., Ltd., London, W. G. Gorham and G. W. Trobridge, both of Ft. Dunlop, Birmingham.

349,439. **Inner Tube Mold.** Goodyear Tire & Rubber Co., assignee of W. H. Campbell, both of Akron, O., U. S. A.

349,524. **Tire Vulcanizing Mold.** Firestone Tyre & Rubber Co., Ltd., Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

349,837. **Branding and Embossing Machine.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

349,862. **Tire Retreading Mold.** H. Taylor, Bondi, Australia.

Germany

531,374. **Shoe-making Machine.** H. C. L. Dunker, Sweden. Represented by E. Wesnigk, Berlin S.W. 61.

531,375. **Press and Vulcanizer.** G. Tietze A. G., Leipzig C. 1.

531,641. **Spreader.** H. Debor, Munich.

532,143. **Dipping mold.** Morgan & Wright, Detroit, Mich., U. S. A. Represented by W. Karsten and C. Wiegand, both of Berlin S.W. 61.

532,718. **Mixer.** C. F. Schnuck and F. H. Banbury, both of Derby, Conn., U. S. A. Represented by A. Zehnden, Berlin S.W. 11.

532,813. **Dipping Mold.** Morgan & Wright, Detroit, Mich, U. S. A. Represented by W. Karsten and C. Wiegand, both of Berlin S.W. 61.

532,814. **Spreader.** Maschinen & Apparatebau-Gesellschaft Martini & Huneke m. b. H., Berlin, S.W. 48.

532,815. **Storage Battery Mold.** G. Siempelkamp & Co., Krefeld.

532,816. **Hydraulic Press.** G. Siempelkamp & Co., Krefeld.

Designs

1,181,508. **Illuminating Device.** Maschinen & Apparatebau-Gesellschaft Martini & Hunecke m. b. H., Berlin S.W. 48.

1,182,903. **Tire Working Device.** Dunlop Rubber Co., Ltd., London, England. Represented by C. Weihe, H. Weil, R. and M. M. Wirth, all of Frankfurt a. Main, and T. R. Koehnhorn, Berlin S.W. 11.

Process

United States

1,815,959. **Porous Filters.** M. Wilderman, London, England, assignor, by mesne assignments, to American Wilderman Porous Ebonite Co., Inc., Philadelphia, Pa.

1,816,472. **Hollow Inflatable Article.** L. and I. Dorogi, both of Budapest, Hungary.

1,816,574. **Tufted Sheet Fibrous Material.** B. H. Foster, Maplewood, N. J., and K. B. Cook, Winnsboro, S. C., assignors to Mechanical Rubber Co., Cleveland, O.

1,816,822. **Floor Covering.** H. A. Bell, assignor to Mechanical Rubber Co., both of Chicago, Ill.

1,817,287. **Shoe Soles.** D. H. Bell, Beverly, Mass.

1,818,349. **Inner Tube.** A. W. Ott, Dubuque, Iowa.

1,819,136. **Plastic Product.** F. C. Dyche-Teague, London, England.

1,819,147. **Rubber Covered Article.** B. Bronson, Lakewood, assignor to Ohio Rubber Co., Cleveland, both in O.

1,819,344. **Brake Lining.** E. Slade, New York, N. Y.

1,819,435. **Paper-Like Product.** K. L. Moses, Brookline, Mass.

Dominion of Canada

314,010. **Tire.** Goodyear Tire & Rubber Co., Akron, assignee of A. J. Musselman, Cuyahoga Falls, both in O., U. S. A.

314,014. **Tire.** Goodyear Tire & Rubber Co., assignee of W. E. Shively, both of Akron, O., U. S. A.

314,015. **Tire.** Goodyear Tire & Rubber Co., assignee of B. Darrow, both of Akron, O., U. S. A.

314,016. **Pneumatic Tire.** Goodyear Tire & Rubber Co., assignee of A. J. Musselman, Cuyahoga Falls, both in O., U. S. A.

314,018. **Pneumatic Tire.** Goodyear Tire & Rubber Co., assignee of G. D. Mallory, both of Akron, O., U. S. A.

314,269. **Reduced Size Ball.** A. G. Spalding & Bros. of Canada, Ltd., Brantford, Ont., assignee of J. R. Gammeter, Akron, O., U. S. A.

314,270. **Reduced Size Ball.** A. G. Spalding & Bros. of Canada, Ltd., Brantford, Ont., assignee of M. B. Reach, Springfield, and J. B. Dickson, Northampton, co-inventors, both in Mass., U. S. A.

United Kingdom

349,063. **Molding Rubber.** Dunlop Rubber Co., Ltd., London, and E. W. Madge, Ft. Dunlop, Birmingham.

349,642. **Protecting Cables from Teredos.** Electrical Research Products, Inc., New York, assignee of J. F. Wentz, Mt. Vernon, both in N. Y., U. S. A.

349,660. **Hot Vulcanized Footwear.** D. F. Wilhelmi, Oosterbeek, Holland.

Germany

531,910. **Spreading Fabrics with Dispersions.** Metallgesellschaft A. G., Frankfurt a. Main.

532,347. **Goods from Dispersions.** Anode Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin S.W. 61.

532,719. **Making Folded Bladders.** Dunlop Rubber Co., Ltd., London, England. Represented by C. Weihe, H. Weil, R. and M. M. Wirth, all of Frankfurt a. Main, and T. R. Koehnhorn, Berlin S.W. 11.

Chemical

United States

1,815,998. **Rubber Protecting Coating.** S. C. Witherspoon, Edgewood, Md., and A. F. Beal, Washington, D. C.

1,816,018. **Concentrated Latex.** C. C. Loomis, Yonkers, and H. E. Stump, Brooklyn, both in N. Y., assignors, by mesne assignments, to United States Rubber Co., a corporation of N. J.

1,816,242. **Rubber Emulsion.** W. B. Wescott, assignor to Rubber Latex Research Corp., both of Boston, Mass.

1,816,764. **Sponge Rubber.** Y. Cornic, Asnieres, France.

1,816,851. **Antioxidant.** J. R. Ingram, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,816,922. **Rubber Concrete Coating.** P. H. Watkins, assignor to Naugatuck Chemical Co., both of Naugatuck, Conn.

1,817,108. **Dieletric Composition.** G. Steerup. Maywood, assignor, by mesne assignments, to American Electric Co., Inc., Chicago, both in Ill.

1,817,323. **Rubberized Sheet Material.** H. D. Rice, Bristol, R. I., assignor to Woonsocket Rubber Co., Millville, Mass.

1,817,363. **Tackiness Reducing Compound.** W. A. Gibbons, Great Neck, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,817,933. **Bituminous Rubber Composition.** E. S. Ross, Pittsburgh, Pa., assignor to Philip Carey Mfg. Co., a corporation of O.

1,818,575 and 1,818,576. **Rubber Coated Fabric.** A. N. Parrett, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

1,818,770. **Dispersing Carbon.** W. F. Tuley, Nutley, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,818,934. **Accelerator.** J. Teppema, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,818,935. **Preparation of Thiazoles.** J. Teppema and L. B. Sebrell, assignors to Goodyear Tire & Rubber Co., all of Akron, O.

1,818,937. **Treatment of Airbags.** C. Van Rennes, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,818,942. **Antioxidant.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,819,416. **Rubber Composition.** M. T. Harvey, E. Orange, assignor to Harvel Corp., Newark, both in N. J.

1,819,647. **Microporous Rubber.** E. W. Madge, Erdington, Birmingham, England, assignor to Dunlop Rubber Co., Ltd., a British company.

1,819,792. **Accelerator.** C. J. Romieux, Elizabeth, and L. J. Christmann, Jersey City, both in N. J., assignors to American Cyanamid Co., New York, N. Y.

Dominion of Canada

313,777. **Coating Composition.** I. G. Farbenindustrie A. G., Frankfort a. M., assignee of H. Beller and C. Heuck, both of Ludwigshafen-on-Rhine, and M. Luther, Mannheim, co-inventors, all in Germany.

313,899. **Vulcanizing Method.** F. W. Farr, Northampton, England.

313,988. **Age Resister.** E. I. du Pont de Nemours & Co., Wilmington, Del., assignee of W. S. Calcott and W. A. Douglass, coinventors, both of Penns Grove, N. J., all in the U. S. A.

314,009. **Age Resister.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

314,017. **Pigment Dispersion.** Goodyear Tire & Rubber Co., assignee of H. A. Endres, both of Akron, O., U. S. A.

314,039. **Rubber Reclaiming Process.** Philadelphia Rubber Works Co., Dover, Del., assignee of J. K. Mitchell, Villa Nova, Pa., both in the U. S. A.

314,407. **Adhesive Rubber Composition.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of J. McGavack, Leonia, and A. A. Nikitin, Passaic, coinventors, both in N. J., U. S. A.

314,590. **Age Resister.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of L. H. Howland, Passaic, N. J., U. S. A.

United Kingdom

348,213. **Washed Rubber.** Electrical Research Products, Inc., New York, N. Y., U. S. A., and F. C. Tomlins, London.

348,299. **Rubber Composition.** J. E.

Pollak, London. (W. B. Wiegand, New York, N. Y., U. S. A.)

348,303. **Adhering Rubber to Metal.** Dunlop Rubber Co., Ltd., London, D. F. Twiss and F. A. Jones, both of Dunlop Rubber Co., Birmingham.

348,388. **Rubber Composition.** M. M. Ehrlich, Paris, France.

348,489. **Age Resister.** Imperial Chemical Industries, Ltd., London.

348,511. **Gutta Percha Composition.** V. H. Forssman, Cologne, Germany.

348,537. **Aqueous Dispersions.** Anode Rubber Co., Ltd., Guernsey, assignee of E. B. Newton, Akron, O., U. S. A.

348,589. **Latex Process.** British Celanese, Ltd., London, and W. A. Dickie, Spondon.

348,682. **Accelerator.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany.)

348,761. **Rubber Composition.** Barrett Co., New York, N. Y., assignee of A. B. Cowdery, Needham, Mass., and T. A. Bulifant, Maywood, N. J., all in the U. S. A.

348,864. **Adhesive for Transfers.** H. E. Peace, Birmingham.

348,985. **Antioxidant.** Imperial Chemical Industries, Ltd., London.

349,105. **Submarine Cable Filling.** Western Electric Co., Ltd., London. (Bell Telephone Laboratories, Inc., New York, N. Y., U. S. A.).

349,273. **Rubber Latex Composition.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

349,280. **Rubber Reclaiming Process.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of W. A. Gibbons, Montclair, N. J., both in the U. S. A.

349,371 and 349,391. **Age Resister.** Imperial Chemical Industries, Ltd., London.

349,440. **Joint Filling Material.** H. P. Stevens, London.

349,461. **Accelerator.** Dunlop Rubber Co., Ltd., London, D. F. Twiss and F. A. Jones, both of Ft. Dunlop, Birmingham.

349,499. **Synthetic Rubber.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany.)

349,602. **Abrasive Rubber Dispersions.** Carborundum Co., Ltd., Manchester, assignee of R. C. Benner, Niagara Falls, N. Y., U. S. A.

349,903. **Rubber Coating Emulsions.** Imperial Chemical Industries, Ltd., London. W. Baird and H. M. Bunbury, both of Manchester.

349,919. **Brake Lining.** Raybestos-Manhattan, Inc., Passaic, N. J., assignee of H. Abert, New York, N. Y., and A. Whitelaw, Passaic, N. J., all in the U. S. A.

349,931. **Composition.** Bakelite Ges., Berlin, Germany.

349,976. **Synthetic Rubber.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany).

349,981. **Thermoplastic Cement.** Bakelite Corp., New York, N. Y., assignee of M. E. Delaney, Bloomfield, N. J., both in the U. S. A.

350,106. **Aqueous Dispersion Coating.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., Guernsey, D. F. Twiss, and R. G. James, both of Dunlop Rubber Co., Ft. Dunlop, Birmingham.

350,161. **Accelerator.** Imperial Chemical Industries, Ltd., London, H. M. Bunbury, W. J. S. Naunton, and W. A. Sexton, all of Manchester.

350,358. **Fabric Proofing.** Imperial Chemical Industries, Ltd., London.

350,450. **Rubber Dispersion Paints.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., Guernsey, E. A. Murphy, A. Niven, and D. F. Twiss, all of Dunlop Rubber Co., Ft. Dunlop, Birmingham.

350,490. **Tire Composition.** I. G. Farbenindustrie A. G., Frankfort a. M., Germany.

350,855. **Synthetic Rubber Composition.** Compagnie Generale D'Electricite, Paris, France.

Germany

532,271. **Rubberlike Masses.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

532,346. **Attaching Rubber to Metal.** A. Jenny, Berlin W. 30.

532,456. **Rubberlike Vulcanizates.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

532,457. **Sponges.** Y. Cornic, Asnieres, Seine, France. Represented by G. Dollner, M. Seiler, E. Maemecke, and B. Wehr, all of Berlin S.W. 61.

General

United States

1,815,916. **Rotation Indicating Wringer Roll.** G. R. Keltie, assignor to American Wringer Co., Inc., both of Woonsocket, R. I.

1,815,924. **Vehicle Shock Absorber.** E. Lenhardtson, Buenos Aires, Argentina.

1,816,076. **Brake Expansion Tube.** S. G. Down, Edgewood, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

1,816,108. **Rubber Sponge.** M. E. Blumenfeld, Savannah, Ga.

1,816,176. **Tire.** V. Castorina, W. New York, N. J.

1,816,232. **Wrist Attachable Blotter.** V. E. Robison, Bellingham, Wash.

1,816,243. **Well Cementing Plug.** N. W. Wickersham, assignor to Perkins Cementing, Inc., both of Los Angeles, Calif.

1,816,652. **Uniform Suit Binding.** K. Nakashian, Brooklyn, N. Y.

1,816,740. **Flexible Armored Hose.** C. F. Ogren, assignor to Thermoid Rubber Co., both of Trenton, N. J.

1,816,804. **Valve Coupling.** R. W. Sethman, assignor to Akron Rubber Mold & Machine Co., both of Akron, O.

1,817,249. **Composite Shoe Heel Sheet.** B. Gilowitz, New York, assignor of 1/8 to J. Smith and 20 per cent to E. S. Steinberg, both of Bronx, all in N. Y.

1,817,300. **Footwear.** I. and L. Dorogi, both of Budapest, assignors of 1/2 to Dr. Dorogi Es Tarsa Gummigyar R. T., Budapest-Albertfalva, both in Hungary.

1,817,356. **Hollow Cushion Tire.** G. F. Fisher, Quincy, Mass., assignor to Morgan & Wright, Detroit, Mich.

1,817,436. **Rubber Shackle.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,817,585. **Brush.** M. Samuel, Rostock, Germany.

1,817,616. **Jumping Rope.** W. F. Goff, Akron, O.

1,817,652. **Hypodermic Syringe.** A. E. Smith, Los Angeles, Calif.

1,818,100. **Friction Brake.** B. F. Shields, Seattle, Wash.

1,818,127. **Submarine Cable Insulation.** J. J. Gilbert, Port Washington, assignor to Western Electric Co., Inc., New York, both in N. Y.

1,818,536. **Valved Inflatable Rubber Former.** J. R. Crossan, Wadsworth, and J. E. Mackel, Johnsons Corners, both in O., assignors to Seiberling Rubber Co., a corporation of Del.

1,818,608. **Safety Gas Tank Cap.** G. C. Chafkin, Brooklyn, N. Y.

1,818,715. **Cushion Connection.** W. C. Keys, Detroit, Mich., assignor to Mechanical Rubber Co., Cleveland, O.

1,818,758. **Nonmetallic Connection.** C. Saurer, assignor to Mechanical Rubber Co., both of Cleveland, O.

1,818,798. **Pulley.** A. L. Freedlander, Dayton, O.

1,818,944. **Pneumatic Tire Casing.** B. Darrow, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,818,950. **Breaker Strip.** G. A. Handy, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,819,128. **Submarine Cable Coil Junction Box.** E. Schürer, assignor to Felten & Guilleaume Carlswerk Aktiengesellschaft, both of Cologne-Mulheim, Germany.

1,819,150. **Valve Stem.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

1,819,151. **Interchangeable Valve Stem.** J. C. Crowley, Cleveland Heights, O.

1,819,322. **Extractor.** M. Ducasse, San Francisco, Calif.

1,819,328. **Sound Amplifier.** J. B. Hawley, St. Charles, Ill.

1,819,383. **Fountain Pen.** K. S. Parker, assignor to Parker Pen Co., both of Janesville, Wis.

1,819,455. **Vehicle Shock Absorber.** W. C. Broadwell, Brooklyn, N. Y.

1,819,565. **Pneumatic Heel.** C. M. McBride, Eureka, Calif.

1,819,632. **Tire Cushion.** G. H. Young, Chicago, Ill.

1,819,852. **Valve Insides.** J. Volckhausen, Weehawken, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,819,872. **Interchangeable Tire Valve.** G. G. Cooke and M. E. Dayton, assignors of 1/3 to F. W. Smith, all of Detroit, Mich.

1,819,891. **Tire.** F. D. Goodlake, Memphis, Tenn.

1,819,913. **Container Cover.** T. W. Miller and A. D. Greene, assignors to Faultless Rubber Co., Ashland, O.

Dominion of Canada

313,595. **Life Saving Hood.** A. Belloni, Portovenere, Italy.

313,614. **Hanger.** P. S. Coles, Atlanta, Ga., U. S. A.

313,640. **Air Valve.** E. B. Killen, London, E.C. 4, England.

313,653. **Air Cushion.** F. Mitchell, Manchester, England.

313,658. **Artificial Denture.** H. D. Morgan, Youngstown, O., U. S. A.

313,675. **Nipple.** J. P. Richards, Toronto, Ont.

313,680. **Shoe Pad.** L. Ruth, Lancaster, Pa., U. S. A.

313,681. **Pneumatic Cushion.** R. W. Sampson, New York, N. Y., U. S. A.

313,701. **Storage Battery Vent.** C. C. Wallace, Philadelphia, Pa., U. S. A.

313,760. **Automobile Floor.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. C. Keys, Detroit, Mich., and A. J. Brown, Lakewood, O., co-inventors, both in the U. S. A.

313,762. **Hose.** Dunlop Tire & Rubber Goods Co., Ltd., assignee of G. A. Ansell, both of Toronto, Ont.

313,860. **Heel Pad.** T. Tanigawa, Honolulu, Hawaii.

313,904. **Inside Adhesive Tire Patch.** W. H. Hodgson, Swift Current, Sask.

313,918. **Vibration Dampener.** H. C. Lord, Erie, Pa., U. S. A.

313,991. **Floor Covering Parting Strip.** T. Eaton Co., Ltd., assignee of J. J. Vaughan, both of Toronto, Ont.

314,019. **Air Connection.** Goodyear Tire & Rubber Co., assignee of C. R. Kline, both of Akron, O., U. S. A.

314,056. **Roll.** Stowe & Woodward Co., Newton Upper Falls, assignee of F. R. Woodward, Newton, both in Mass., U. S. A.

314,093. **Resilient Wheel.** N. J. Holmes, Moonee Ponds, and C. Taylor, Albert Park, co-inventors, both in Victoria, Australia.

314,102. **Electric Signal.** M. F. Alder, Louisville, Ky., U. S. A.

314,110. **Screw Cap Cover Gripper.** O. Brindley, Vancouver, B. C.

314,124. **Flexible Tube.** R. Debenedetti, Turin, Italy.

314,166. **Sock Suspender.** G. Schilling, Berlin-Charlottenburg, Germany.

314,266. **Valve Cap.** A. Schrader's Son, Inc., assignee of J. Wahl, both of New York, N. Y., U. S. A.

314,316. **Electro-Therapeutic Hair Brush.** D. Simpson, London, E.C. 3, assignee of A. A. S. Barker, Southchurch, both in England.

314,349. **Heat Insulating Material.** J. H. Johnson, Toronto, Ont.

314,530. **Motor Vehicle Brake Mechanism.** J. W. Postel, Palisade, N. J., U. S. A.

314,547. **Catamenial Appliance.** I. E. Sutherland, Carlin, B. C.

314,582. **Ice Cream Cabinet Container.** Copeman Laboratories Co., assignee of L. G. Copeman, both of Flint, Mich., U. S. A.

United Kingdom

347,900. **Shaft Coupling.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts Ges., Berlin, Germany.

347,929. **Submarine Cable.** Norddeutsche Seekabelwerke Akt.-Ges., Nordenham-on-Weser, Germany.

348,325. **Endless Belt Conveyer.** G. J. Fisher, Monmouthshire.

348,348. **Bed Pan.** L. A. Chambers, St. Louis, Mo., U. S. A.

348,385. **Springs.** W. Ormsby, Lincolnshire.

348,486. **Laminated Springs.** L. Renault, Seine, France.

348,532. **Cable.** W. S. Smith, Devon; H. J. Garnett, Sevenoaks, Kent; and E. W. Smith, Hertfordshire.

348,746. **Collapsible Container.** National Cantube Corp., assignee of J. E. Grimes, both of Chicago, Ill., U. S. A.

348,827. **Billiard Table Cushion.** H. Robinson and Burroughes & Watts, Ltd., both of London.

348,935. **Ball.** A. Miniaty, Madrid, Spain.

348,971. **Band Brake.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

348,981. **Cycle Handle.** H. H. Burton and A. G. Barrett, both of Leicester.

349,095. **Aviators' Overalls.** H. Sonabend, Warsaw, Poland.

349,136. **Boot Protector.** O. Herfeld, Zurich, Switzerland.

349,144. **Tire Pressure Gage.** A. Schrader's Son, Inc., Brooklyn, assignee of J. Wahl, Rosedale, both in N. Y., U. S. A.

349,208. **Boot Sock.** M. and L. Western, both of Manchester.

349,351. **Nipple.** E. Spinetto, Waitomo Caves, New Zealand.

349,353. **Universal Joint.** E. Bugatti, Molsheim, Bas-Rhin, France.

349,581. **Molded Packings.** Compagnie General D'Electricite, Paris, France.

349,770. **Hair Waving Appliance.** R. Lemaire, Solingen, Germany.

349,885. **Tampon.** J. E. F. Deakin, Sydney, Australia.

349,965. **Flexible Tube.** W. H. Grint and Superflexit, Ltd., both of London.

350,045. **Blocking Hats.** F. H. Eve and W. J. Wood, both of Luton.

350,061. **Knife for Tapping Latex.** J. Bosch, Java, Dutch East Indies.

350,074. **Pipe Joint.** A. W. French, Birmingham.

350,100. **Inflating Valve.** S. Saul, Aix-la-Chapelle, Germany.

350,142. **Children's Headgear.** J. and E. Peate, both of Liverpool.

350,149. **Tire.** Q. A. Giacosa, Cannes, France.

350,237. **Tire Tread.** H. Hürlimann, Wil St. Gallen, Switzerland.

350,242. **Pneumatic Tire.** E. V. Ocampo, Montevideo, Uruguay.

350,354. **Mudguard.** H. Jones, Middleton St. George.

350,355. **Safety Razor.** G. Bemelmans, Limbourg, Belgium.

350,493. **Inside Heel Cushion.** T. Tanigawa and F. K. Makino, both of Honolulu, Hawaii.

350,523. **Leggings.** D. Black, Glasgow, Scotland.

350,589. **Insoles.** I. H. Robinson, London.

350,659. **Heel.** Bank Bridge Works, Ltd., and L. De Smith, both of London.

350,760. **Surgical Compression Appliance.** O. E. Jauer, Berlin, Germany.

350,761. **Teapot Pouring Attachment.** H. Febland, Clacton-on-Sea.

351,034. **Saddle and Pillion Seat.** A. V. Mellano, Thames Ditton, Surrey.

351,081. **Slicing Machine.** Berkel & Parnall's Slicing Machine Mfg. Co., Ltd., and H. Thomas, both of Middlesex.

351,083. **Tire Valve.** J. Bane, London.

351,206. **Golf Tee Carrier.** G. P. Mitchell, Blackburn.

351,426. **Globe Map.** A. Landini, Bologna, Italy.

Germany

511,008. **Massage Device.** P. Koment, Oakland, Calif., U. S. A. Represented by H. Goldbeck, Berlin S.W. 11.

532,207. **Block Belt.** J. Meyer, Cologne.

532,749. **Shoe Tread Patch.** E. C. Loewenguth, Paris, France. Represented by A. Spreer, Leipzig C. 1.

Designs

1,179,805. **Sponge Scrubber.** H. Kaiser, Kotzschenbroda.

1,179,810. **Sponge Brush.** H. Kaiser, Kotzschenbroda.

1,179,999. **Advertising Card.** E. Kirschbaum, Solingen-Hohscheid.

1,180,195. **Overshoe.** Firma M. Steinberg, Köln-Braunsfeld.

1,180,330. **Cape.** Lincas Gummiwarenfabrik, Berlin-Charlottenburg.

1,180,350. **Insulating Glove.** F. Tiedt, Finsterbergen, Thuringia.

1,180,622. **Sock with Elastic Border.** E. Rossler, Gelenau i. Erzgeb.

1,180,709. **Rubber-covered Metal Roll.** Firma Aug. Blodner, Gotha.

1,180,859. **Overshoe.** Continental Gummiwerke A. G., Hannover.

1,180,923. **Building Block.** E. Pennewitz, Magdeburg.

1,180,925. **Bathing Cap.** Hungaria Guttapercha es Gummairugyar R. T., Budapest, Hungary. Represented by G. Lotterhos, Frankfurt a. Main, and H. Mortensen and W. v. Sauer, both of Berlin S. W. 11.

1,181,019. **Washstand Splasher.** New York Hamburger Gummiwaaren-Co., Hamburg 33.

1,181,020. **Toilet Seat.** New York Hamburger Gummiwaaren-Co., Hamburg 33.

1,181,188. **Pail Protector.** E. Mosges, Wuppertal-Elberfeld.

1,181,207. **Protector for Pails, etc.** A. Hoppert, Limbach i. Sa.

1,181,211. **Rupture Belt.** E. Goltz, Gr. Spalienen, Kr. Ortelsburg.

1,181,753. **Device for Sinks.** G. Martin, Dresden-Laubegast.

1,181,829. **Valve.** H. Reiser, Gelsenkirchen.

1,181,837. **Toilet Seat Bumper.** G. Hulsmann, Oberhausen, Rhld.

1,181,896. **Sole.** R. Unger, Zwickau i. Sa.

1,181,987. **Ammonia Bottle Top.** F. Kibele, Weissenfels a. d. S.

1,182,423. **Pilot Balloon.** Continental Gummiwerke A. G., Hannover.

1,182,456. **Tire.** P. Hollek, Gleiwitz 2.

1,182,549. **Bathing Cap.** Continental Gummiwerke A. G., Hannover.

1,182,626. **Friction Surface.** Continental Gummiwerke A. G., Hannover.

1,182,923. **Divided Inner Tube.** H. Hoffman, Hamburg.

1,182,996. **Balloon with Windmill.** Elastic-Gummi-Co., Riedl & Co., Frankfurt a. Main.

1,182,999. **Rubber-lined Horse Shoe.** W. Ohliger, Opladen.

1,183,144. **Air Bladder.** C. Muller, Gummiwaarenfabrik A. G., Berlin-Weissensee.

1,183,164. **Mud-guard for Heels.** P. Gerschinski, Berlin-Schoneberg.

1,183,171. **Floating Body.** Holstein & Kappert Maschinenfabrik Phöenix G. m. b. H., Dortmund.

1,183,226. **Strips for Metal Chairs, etc.** C. Straub, Feuerbach.

1,183,336. **Piano Keys.** New York Hamburger Gummiwaaren-Co., Hamburg, 33.

Trade Marks

United States

285,373. **Tamby.** Toy figures. M. M. Kahn, doing business as Maxwell Rubber Products, Belleville, N. J.

285,376. Representation of a globe and on it the words: **"World Fun."** Inflatable balls and swimming tubes. Essex Rubber Co., Inc., Trenton, N. J.

285,396. **Rusco.** Belting. Russell Mfg. Co., Middletown, Conn.

285,427. Representation of a double circle containing the words: **"New Balance Arch."** Footwear. New Balance Arch Co., Inc., N. Cambridge, Mass.

285,430. **Usco.** Footwear. United States Rubber Co., New York, N. Y.

285,492. **All American.** Golf clubs and balls. Royal Mfg. Co., Toledo, O.

285,534. **Mayam.** Chewing gum. Mayam, Ltd., London, England.

285,566. Representation of a double circle containing the word: **"Pettygolf."** Golf balls. A. M. Feltus, Jr., Vicksburg, Miss.

285,601. **Chad Valley.** Rubber stamps, etc. Chad Valley Co., Ltd., Harborne, England.

285,612. **First Line.** Belting, hose, packing, tires. Pharis Tire & Rubber Co., Newark, O.

285,663. Circle containing representation of an iron cross and thereupon, written horizontally and vertically, the word: **"Plant."** Insulating materials. Plant Rubber & Asbestos Works, San Francisco, Calif.

285,788. **Vulcaid.** Accelerators, antioxidants, etc. Binney & Smith Co., New York, N. Y.

285,870. **Lightnin', Personalized.** Golf balls. U. S. Golf Ball Corp., Chicago, Ill.

286,031. **XXXX** and below the word: **"Fourex."** Prophylactic rubber and membranous articles. J. Schmid, New York, N. Y.

286,032. **Cadets.** Prophylactic rubber and membranous articles. J. Schmid, New York, N. Y.

286,040. **Paragon.** Nipples. J. Schmid, New York, N. Y.

286,042. **Texide.** Prophylactic articles. L. E. Shunk Latex Products, Inc., Akron, O.

286,082. **Long Life.** Elastic fabrics. United Elastic Corp., Easthampton, Mass.

286,142. **Best-Bet.** Storage batteries. Continental Tire Corp., Chicago, Ill.

286,151. Representation of a boy on a skooter and the words: **"Pal-Roy, Scuffers."** Footwear. Palais Royal, Inc., Washington, D. C.

286,154. **Victory 3.** Footwear. Endicott Johnson Corp., Endicott, N. Y.

Dominion of Canada

52,628. Representation of a section of belting with a continuous silver stripe along its outer face. Belts and belting. Raybestos-Manhattan, Inc., Passaic, N. J., U. S. A.

52,663. **Drilastic.** Saddles. Flexible Saddle, Ltd., Birmingham, England.

52,811. Circular background showing the words: **"Zimate"** and **"R. T. Vanderbilt Co."** Accelerator. R. T. Vanderbilt Co., Inc., New York, N. Y., U. S. A.

52,812. Circular background showing the words: **"Tuads"** and **"R. T. Vanderbilt Co."** Accelerator. R. T. Vanderbilt Co., Inc., New York, N. Y.

FINANCIAL

Goodrich Omits Preferred Dividend

While for the past several months earnings after interest but before inventory write down have exceeded preferred dividend requirements, and while The B. F. Goodrich Co., Akron, O., has held its portion of the total sales of the industry, the Board because of the uncertainty in commodity market and in general business decided to defer payment of the October first preferred dividend.

Canadian Goodrich Passes 7% Bond Interest

Holders of 7 per cent income bonds of Canadian Goodrich Co., Ltd., Kitchener, Ont., Canada, have been advised by Eastern Trust Co. that directors of Canadian Goodrich have taken no action relative to the payment of interest on September 1.

It is stated that operations of the company for the first six months of the calendar year did not result in a profit. No intimation is given regarding possibility of resumption of payments, nor of the current business.

New Incorporations

Griffith-Jordan Co., Inc., Sept. 10 (N. Y.), capital $10,000. H. G. Cohen, 1857 E. 18th St., I. Solan, 245 Montauk Ave., both of Brooklyn, N. Y., and A. Goldstein, 233 S. 5th Ave., Mt. Vernon, N. Y. Rubber goods of all kinds.

Griswold, Wilson & Tuttlebee, Inc., Sept. 19 (N. Y.), capital stock $25,000, par value $25. M. C. Griswold, 9 Wellington Rd., F. J. Wilson, 195 Bird Ave., and H. L. Tuttlebee, 107 Purdy St., all of Buffalo, N. Y. Tires and tubes, etc.

Optimit Rubber Works of N. Y., Inc., July 23 (N. Y.), capital 100 shares, no par value. S. Felshin, 25 W. 106th St., H. Bayer, 525 W. End Ave., and R. Geller, 643 Georgia Ave., all of New York, N. Y. Importer of rubber goods from its Czechoslovakian factory.

Simmons Rubber Co., Sept. 3 (Del.), capital stock 100,000 shares common, par value $10. M. W. Cole, J. L. Wolcott, and M. R. Heite, all of Dover, Del. Manufacture, produce, and deal in rubber tires, tubes, fabrics used in the manufacture of rubber goods, etc.

United Kingdom

503,030. **Hutchinson.** Floor coverings. Établissements Hutchinson Co. Nationale du Caoutchouc, Société Anonyme, Paris, France.

503,032. **Hutchinson.** Belting, tires, tubes, repair bands and patches, tubing, hot water bottles, bladders, baths, pump connections, horn bulbs, gas bags, and tobacco pouches. Établissements Hutchinson Co. National du Caoutchouc, Société Anonyme, Paris, France.

514,862. Representation of a lion with his left forepaw on a block containing a monogram of the letters: **"N. E. Co."** Sheet rubber and gutta percha for preparing printing plates or surfaces, or such plates and surfaces of these materials. Nickeloid Electrotype Co., Ltd., London, E.C. 4.

519,693. Word: **"Excelsior"** between two circles, each containing the letter: **"E."** Combs. Continental Gummiwerke A. G., Hannover, Germany.

521,209. Word: **"Excelsior"** between two circles, each containing the letter: **"E."** Toys and dolls. Continental Gummiwerke A. G., Hannover, Germany.

523,535. **Spandit.** Goods of rubber and gutta percha not included in other than Class 40. H. G. Miles, Ltd., London, S.W. 1.

523,542. **Stormet.** Raincoats, waterproof coats, and overcoats. J. Wippell & Co., Ltd., London, S.W. 1.

524,056. **Normandite.** Insulating material. Hightensite, Ltd., London, E. 16.

524,321. **Buchnawasher.** Washers. Worcester Royal Porcelain Co., Ltd., Worcester.

Labels

United States

39,343. **Shu-Lac.** Golf balls. Shu-Lac Co., Bradenton, Fla.

39,384. **Sano Typewriter Pad.** Cushioning pads. Sano Typewriter Pad Co., Wilkes-Barre, Pa.

39,416. **Beech-Nut Brand Chewing Gum, Spearmint.** Chewing gum. Beech-Nut Packing Co., Canajoharie, N. Y.

39,453. **Weldtite.** Rubber cement. Weld-Tite Products & Mfg. Co., Du Bois, Pa.

39,454. **Autogiro.** Chewing gum. Beech-Nut Packing Co., Canajoharie, N. Y.

39,470. **Beech-Nut Brand Chewing Gum, Spearmint.** Chewing gum. Beech-Nut Packing Co., Canajoharie, N. Y.

13,347. **Best By A Long Stretch.** Elastic. Southern Webbing Mills, Inc., Greensboro, N. C.

13,348. **Armored Rubber Threads.** Elastic. Southern Webbing Mills, Inc., Greensboro, N. C.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Aetna Rubber Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 15
Cincinnati Rubber Mfg. Co.	6% Pfd.	$1.50 q.	Sept. 15	.....
Dominion Rubber Co., Ltd.	Pfd.	$1.75 q.	Sept. 30	Sept. 24
Firestone Tire & Rubber Co.	Com.	$0.25 q.	Oct. 20	Oct. 5
General Tire & Rubber Co.	6% Pfd.	$1.50 q.	Sept. 30	Sept. 19
Goodyear Tire & Rubber Co.	Com.	$0.75 q.	Nov. 1	Oct. 1
Goodyear Tire & Rubber Co. of Cal.	Pfd.	$1.75 q.	Oct. 1	Sept. 21
Goodyear Tire & Rubber Co. of Can.	Com.	$1.25 q.	Oct. 1	Sept. 15
Goodyear Tire & Rubber Co. of Can.	Pfd.	$1.75 q.	Sept. 30	Sept. 18
Midwest Rubber Reclaiming Co.	Pfd.	$1.00 q.	Sept. 1	Aug. 31
Stedman Rubber Flooring Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 26

Editor's Book Table

NEW PUBLICATIONS

"Royle Perfected Tubing Machine No. 3, Worm Geared." John Royle & Sons, Paterson, N. J. This bulletin, No. 382, describes the structural features of the Royle Perfected No. 3 worm drive machine and lists its specifications of dimensions, motor horsepower and speed, floor space, and weight. The text is illustrated by excellent views, showing clearly the adjustable interchangeable motor base and optional variable speed conveyer.

"Trichlorethylene—Its Properties and Uses." The Roessler & Hasslacher Chemical Co., Inc., 350 Fifth Ave., New York, N. Y. The physical and chemical properties, specifications, and applications of trichlorethylene are given in detail in this manual. This data is supplemented by references to the many technical uses to which the material is commercially applied.

"Who's the Agent?" A. Brookes, Editor-Proprietor, 3 Mohamed Aly Square, Alexandria, Egypt. This book of 130 pages is a register of the principal overseas firms trading in Egypt, Sudan, Palestine, and Syria with the names and addresses of their agents. The book circulates among the leading mercantile houses, agency firms, government departments, and buyers in the Near East and manufacturers and export houses throughout the world. The volume has four sections: 1., alphabetical names of firms; 2, classified trade section; 3, agents address section, and 4, telegraphic addresses.

"Map of Butler, Bloomingdale, and Vicinity, N. J." Pequanoc Rubber Co., Butler, N. J. This company is one of a large list of business concerns contributing to the free distribution of this map issued by The Chamber of Commerce of Butler and Bloomingdale. In addition to the highways and topographical features located the publication shows several views of public buildings, the Pequanoc Rubber plant, and scenic views.

"Our 75th Year." Druggists' Sundries and Bathing Caps. Catalog No. 75. Davidson Rubber Co., Boston, Mass. This twenty-page booklet briefly describes and illustrates in colors outstanding products of a company now celebrating its seventy-fifth year of activity.

"Selling Rubber Goods." Davol Rubber Co., Providence, R. I. This thirty-page attractively illustrated booklet gives the retail druggist a very brief résume of the history of rubber and of planting, tapping, vulcanizing, and manufacturing processes involved in making druggists' sundries, as well as many very useful hints on how to increase sales by serving the customer well.

National Rubber Machinery Review. The National Rubber Machinery Co., Akron, O. The August, 1931, issue contains illustrated descriptions of many machines specially designed and built by this organization for manufacturing tires and inner tubes. These include various models of individual tire and tube vulcanizers, building drums, expanders, cores, chucks, and cutting machinery for fabric and rubber.

"Advanx Rubber Division — Quality, Value." Advanx Ty-Re-Pair Co., McLachlan Ave., Rushcutters Bay, Sydney, Australia. This collection of bulletins in a loose-leaf binder discusses rubber, modern tire repair materials, Advanx camel back stock, and cements. The exclusive Advanx air-cooled retread tire molds are illustrated, and cures given.

"Fundamental and Practical Aspects of the Compounding and Testing of White Rubber." By Harlan A. Depew, The New Jersey Zinc Co., 160 Front St., New York, N. Y. This comprehensive study of white pigmentation of rubber considers the following basic features of the problem: Definition of white, action of pigments and methods of measuring color; compounding white rubber; discoloration of white rubber; and commercial applications.

BOOK REVIEW

"Davison's Textile Blue Book, 1931." Davison Publishing Co., 50 Union Sq., New York, N. Y.

This publication, now in its sixtieth year, is consolidated with Dockham's American Report and Directory, making 22 directories in one volume. The work lists with details American textile mills of every kind and all concerns having connection with textiles in all their branches. A special feature is new, revised, clear type-style textile maps showing all towns where there are textile plants, dyeing, bleaching, or finishing works.

Other features of interest are: statistics arranged by states showing the number of spindles, looms, cards, and combs in the mills; textile associations; index to cotton merchants; cotton warehouses with insurance ratings; a personal revision of foreign cotton firms' reports, etc.

Two editions are issued. The office size, 1,800 large pages, with a new Permatex cloth and gold binding, is printed on fine paper and contains all the above features, while the "Handy Edition," also Permatex, but printed on 1,600 thin pages has all information given in the office size, except the classified directory of mills, and the textile buyer's guide.

The Norddeutsche Gummiwaren-Fabrik Hannover G. m. b. H., Hannover-Dohren, has released a new bottle stopper of rubber. This has a valve of rustless metal which helps keep the stopper securely in position.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1412	Manufacturer of rubber milk bottle top.
1413	Firms handling compounded rubber.
1414	Sources of supply of microporous rubber.
1415	Manufacturer of rubber boots with exchangeable leather soles.
1416	Dealers in precipitated and refined balata.
1417	Means for attaching a rubber plate to one of zinc.
1418	Manufacturers' agent desires samples of improved tire repair boots and improved blowout boots.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
3071	British exports of footwear, June and first half of 1931.
3072	British exports of automobile casings, June and first half of 1931.
3073	French tire exports, first half of 1931.
3074	French footwear exports, first half of 1931.
3076	Comparative exports of boots and shoes from United States, Canada, and United Kingdom, first half of 1931.
3077	Comparative tire exports from the United States, Canada, United Kingdom, and France, first half of 1931.
3078	United States crude rubber reexports, July, 1931.
3079	Rubber sundries and specialties news letter.
3082	Belgian tire exports, June and six months ended June, 1931.
3083	Japanese exports of tires first six months ended June, 1931.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
‡53,362	Automobile tires and rubber goods	London, England
*53,419	Heels and composition soles	San Pedro Sula, Honduras
‡53,420	Crude rubber for soles.	Milan, Italy
*53,473	Belting	Reykjavik, Iceland
‡53,484	Automobile tires	Lisbon, Portugal
†53,546	Soles, heels, and erasers	La Paz, Bolivia
*†53,551	Pneumatic and solid tires and inner tubes	Algiers, Algeria
†53,565	Rubberized cloth	Groningen, Netherlands
†53,599	Toy balloons	Aarus, Denmark
*53,600	Toy balloons	Hamburg, Germany
†53,603	Aprons, baby pants, bibs, pure gum or rubberized fabrics, druggists' sundries, erasers, and rubber bands.	Lisbon, Portugal
†53,633	Canvas shoes	Panama City, Panama
†53,674	Heels and soles	Guatemala City, Guatemala
*53,675	Scrap rubber	Kobe, Japan
*†53,678	Surgical goods	Buenos Aires, Argentina
†53,689	Sport goods	Madrid, Spain
†53,788	Rubber sundries	Shanghai, China
*53,789	Footwear and tires	Berlin, Germany
†53,797	Erasers	Milan, Italy
†53,808	Tires	Pernambuco, Brazil
*53,871	Tires	Rotterdam, Netherlands
†53,898	Druggists' sundries and mats	Montreal, Canada
†53,915	Mats, chair cushions, toy bouncers, and balls	Montreal, Canada
†53,951	Toy bouncers and balls	Montreal, Canada

*Purchase. †Agency. *†Purchase and agency. ‡Either.

Market Reviews

Crude Rubber

New York Exchange

THE fact that rubber shipments from Malaya for August and September were at about 43,000 tons in each month, almost tells the story of the action of rubber in itself.

The heavy shipments that continue to arrive simply pile up more rubber on an already overstocked world; and since the rate of consumption is low, there is no outlet for this unhealthy surplus. Consumption in August was little more than 27,500 tons, and for September it is expected to be only 25,000 tons.

Stocks on hand both at Great Britain and here are at extremely high levels. And the political and financial troubles in England are also a disturbing influence, although our markets on the days immediately following the announcement of suspension of gold payments acted rather well. Even in the face of announced wage cuts by U. S. Steel and two of the large rubber companies, the market showed surprising strength. The attitude seems to be that every one of these announcements is so much bad news out of the way.

On the other side of the picture the lower outputs in Ceylon, Dutch East Indies, and estates in the East, have led some to believe that the long overdue curtailment of production is becoming a verity. The low prices that have prevailed for such a length of time are also said to be factors that will certainly lead to curtailment sooner or later.

The fact that producers are making no profits, and consequently paying no taxes to the government, lends support to the recent agitation for an export tax on rubber from producing countries, which should add materially to the price of rubber. The governments need the money; and if estates cannot pay, the only thing left to do is to assess the buyers.

Week ended August 29. Low foreign cables, wide selling by commission houses, and extremely light trading made for an easier market. The all-time low record was pushed down another notch when old September "A" contracts sold at 4.80 cents. Standard contracts, too, set new low records.

Perhaps the main reason for the drooping tendency of the market is the estimate that shipments from Malaya for August will be about 44,000 tons at least, with some traders predicting shipments of 47,000 tons. For the current week it is expected that Liverpool stocks will show an increase of 900 tons.

The high production level has given rise to all sorts of conjectures. In London it is declared that it is inevitable that a number of estates will fail. Rubber below 5 cents is unprofitable. But that story is old, and while each successive price is declared to be the absolute minimum at which rubber can be tapped, the natives continue to produce rubber at too high rates. For the first 6 months of this year, production on 615 estates which report to the Department of Commerce, was greater than in 1930 or in 1929. Dutch estate production is also being maintained at a high level.

RUBBER BULL POINTS

1. Ceylon shipments for August were 3,756 tons, against 4,212 tons during July, and 6,701 tons during August last year.
2. Shipments from Dutch East Indies for July were 25,293 tons, against 24,371 tons in June, and 22,032 tons in July last year.
3. British and Dutch growers may yet get together on restriction.
4. Reduced production is believed to have reduced Harbor Board stocks at Singapore and Penang to 5,617 tons at the close of August, compared with 7,372 tons at the close of July, and 5,877 at the close of August last year.
5. Native rubber growers are switching in some degree from rubber to food crops.
6. Production on estates under 100 acres in size, largely native, was 15,106 tons, against 15,691 in July; output on estates of over 100 acres in size, chiefly European-owned, totaled 20,941 tons, compared with 21,371 in July.
7. Proposed export taxes may add to the price of rubber.

RUBBER BEAR POINTS

1. Gross Malayan shipments were 42,832 tons in August, against 43,658 in July, and 47,802 in August last year.
2. Estimates put the Malayan shipments for September at 43,000 tons.
3. Automobile output dropped 12 per cent in August; for the first 8 months of 1931 output was 27 per cent below that in the same period last year.
4. Consumption in the United States for August was 27,586 tons, compared with 31,937 tons in July, and 30,575 tons in August last year.
5. Consumption in September is estimated at about 25,000 tons.
6. Dealers' stocks of crude rubber in the Far East amounted to 42,393 tons on August 31, compared with 42,649 tons at the end of July, and 41,313 tons on August 31, 1930.
7. United Kingdom stocks total about 137,000 tons compared with 114,000 a year ago.
8. Stocks on hand and afloat to the United States at the close of August were 302,285 tons.

The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—NO. 1 STANDARD CONTRACTS

Positions 1931	August, 1931					September, 1931							
	26	27	28	29	31	1	2	3	4	5*	7*	8	9
Aug.	4.93	4.87	....	....	....	....	....	....	....	....	....	....	....
Sept.	4.96	4.90	4.89	4.88	4.93	4.86	4.90	4.88	4.88	....	....	4.97	5.10
Oct.	5.03	5.00	4.96	4.95	5.00	4.93	4.97	4.94	4.92	....	....	5.03	5.13
Nov.	5.11	5.06	5.03	5.02	5.07	5.00	5.03	5.00	4.96	....	....	5.09	5.17
Dec.	5.18	5.13	5.11	5.08	5.15	5.08	5.10	5.05	5.00	....	....	5.15	5.20
1932													
Jan.	5.25	5.20	5.18	5.15	5.22	5.16	5.17	5.12	5.07	....	....	5.22	5.27
Feb.	5.32	5.27	5.25	5.22	5.30	5.23	5.24	5.19	5.14	....	....	5.30	5.34
Mar.	5.40	5.35	5.32	5.30	5.38	5.31	5.32	5.26	5.23	....	....	5.38	5.42
Apr.	5.47	5.43	5.40	5.39	5.46	5.38	5.40	5.33	5.31	....	....	5.43	5.48
May	5.55	5.52	5.48	5.48	5.54	5.46	5.49	5.41	5.39	....	....	5.52	5.55
June	5.62	5.59	5.56	5.55	5.61	5.54	5.56	5.49	5.44	....	....	5.59	5.62
July	5.70	5.67	5.65	5.63	5.68	5.62	5.63	5.56	5.50	....	....	5.66	5.70
Aug.	....	....	....	....	....	5.72	5.72	5.66	5.60	....	....	5.76	5.79

* Holiday.

Positions 1931	September, 1931												
	10	11	12	14	15	16	17	18	19	21	22	23	24
Aug.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sept.	5.15	5.32	5.15	5.02	4.95	5.00	5.10	5.05	4.95	4.95	4.94	5.02	4.85
Oct.	5.15	5.34	5.18	5.02	4.95	5.00	5.13	5.07	4.98	4.85	4.90	5.02	4.90
Nov.	5.18	5.37	5.20	5.08	5.00	5.05	5.16	5.09	5.01	4.85	4.90	5.06	4.95
Dec.	5.22	5.40	5.23	5.15	5.06	5.10	5.19	5.12	5.04	4.85	4.90	5.10	5.00
1932													
Jan.	5.28	5.47	5.29	5.21	5.11	5.16	5.25	5.18	5.10	4.91	4.95	5.15	5.05
Feb.	5.35	5.54	5.36	5.28	5.18	5.23	5.31	5.25	5.16	4.97	5.01	5.20	5.10
Mar.	5.43	5.62	5.43	5.35	5.25	5.30	5.37	5.32	5.22	5.04	5.07	5.25	5.15
Apr.	5.51	5.69	5.50	5.42	5.33	5.36	5.44	5.37	5.28	5.09	5.13	5.32	5.20
May	5.57	5.76	5.57	5.50	5.41	5.43	5.52	5.43	5.35	5.15	5.20	5.40	5.26
June	5.64	5.85	5.64	5.57	5.48	5.51	5.60	5.51	5.41	5.23	5.26	5.48	5.32
July	5.72	5.94	5.72	5.65	5.55	5.59	5.68	5.59	5.48	5.31	5.32	5.57	5.38
Aug.	5.80	6.04	5.82	5.75	5.65	5.69	5.78	5.69	5.57	5.41	5.42	5.67	5.47

Manufacturers seem to be adjusting themselves to the new level of prices. One of the largest announced that rubber products would be offered at new low prices and that extensive advertising would be used to increase sales on these products.

On August 28 the Department of Commerce announced that July automobile production was the smallest of any month this year with the exception of January. The total was 218,961 cars, a drop of 31,696 vehicles from the June total of 250,657 units. It compared with 265,533 in the same month last year and with 500,840 in July, 1929. The drop is probably caused by the fact that one of the largest manufacturers of low-priced cars has closed down, and rumors have it that new models will soon be put on the market by this automobile manufacturer.

Passenger car registrations for July are estimated to be less than in June, contrary to the seasonal trend which usually shows an increase. In spite of this fact, however, it is reported that gasoline consumption this year has been about 2 per cent above last year's total. The bright spot, if it can be called that, in the automobile field is that cars in the hands of dealers are at a low level, as well as tires, and all that is lacking is a better demand.

Prices at the close of August 29 on the No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Sept.	...	...	4.88/4.90	4.89
Oct.	...	...	4.95	4.96
Nov.	...	...	5.02	5.03
Dec.	5.06	5.06	5.08	5.11
Jan.	...	...	5.15	5.18
Feb.	...	...	5.22	5.25
Mar.	5.31	5.28	5.30	5.32
Apr.	...	...	5.39	5.40
May	5.50	5.50	5.48	5.48
June	...	...	5.55	5.56
July	5.63	5.63	5.63	5.65
Spot	...	...	4.95	4.95

Week ended September 5. Prices were practically unchanged for the week, with trading mostly quiet and in small quantities. Shipments from Malaya for August were lower than expected, but this was offset by lower cables from London. Traders were also evening up for the three-day holiday.

Gross shipments from Malaya during August were 42,832 tons, compared with 43,658 tons in July, and 47,802 in August, 1930. Earlier estimates put the figure at between 43,000 and 47,000 tons. Of the August total from Malaya, 27,634 tons came to the United States, compared with 27,645 tons in July, and 27,051 tons during August, 1930.

Ceylon shipments were 3,756 tons, compared with 4,212 tons during July, and 6,701 tons during August last year. Of this amount 2,796 tons were exported to the United States, against 3,035 tons in July, and 3,362 tons during August, a year ago.

It was reported that British rubber interests tried to engage the Dutch authorities in a conference on a proposed rubber stabilization plan, but the new Governor-General of the Dutch East Indies refused to consider it until he had heard from the Dutch growers.

In view of these developments a few figures given in a recent report of Symington & Sinclair, of London, are significant.

"Last year," says the report, "shipments of rubber from producing countries totaled 815,000 tons. Of this total 541,000 tons, equal to 66½ per cent, were shipped from territory directly under British control. To this one may add 82,000 tons shipped by British owned estates operating in the Dutch East Indies. This gives a total of 623,000 tons, equal to 76½ per cent of the total shipments, the selling price at which is of direct interest to British owners and on this quantity each 1d. per lb. is equal in round figures to £6,000,000 sterling (about $29,280,000).

"The non-British owned output from the Dutch East Indies, estate and native combined, amounted in 1930 to 160,000 tons. If this is added to the above figure of 623,000 tons, we get 783,000 tons, equal to 96 per cent of the world's total shipments, which are under the direct control of the British and Dutch. On this total each 1d. per lb. makes a difference of £7,300,000 sterling (about $35,625,000)."

These figures reveal how important it is for the British and the Dutch to act jointly in any restriction plan. With 96 per cent of the rubber under their control, the Dutch and the British working together should be able to effect a workable plan.

Prices at the close of September 5 on the No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Sept.	...	...	4.88	4.88
Oct.	...	...	4.92	4.94
Nov.	...	...	4.96	5.00
Dec.	5.05	5.00	5.00/5.02	5.05/5.07
Jan.	...	...	5.07	5.12
Feb.	...	...	5.14	5.19
Mar.	5.26	5.23	5.23	5.26/5.27
Apr.	...	...	5.31	5.33
May	5.45	5.39	5.39	5.41
June	...	...	5.44	5.49
July	5.59	5.50	5.50	5.56/5.57
Aug.	...	...	5.60	5.66
Spot	...	...	4.95	4.95

Week ended September 12. Gains scored every day up to Friday boosted prices more than 40 points, but about 15 to 20 of these were lost in Saturday's trading on the publication of unfavorable statistics.

Consumption figures published at the end of the week were disappointing as were figures on rubber stocks. Consumption during August was estimated at 27,586 tons, compared with 31,937 tons in July and 30,575 tons in August last year. Stocks on hand increased to 240,816 tons, against 234,822 tons at the end of July and 158,178 at the end of August last year.

The drop in consumption more than offset the slight drop in shipments from the Far East. At 43,832 tons, rubber shipped from Malaya during August was slightly less in quantity than the estimates of 43,000 tons and over. But consumption had been expected to hit at least 30,000 tons; so the two figures canceled each other with a balance on the wrong side.

The rise in the market in the last week was accomplished quietly and under no other apparent stimulus than the renewed hopes that restriction efforts would become effective and furnish a solution, no matter how temporary, to prevailing conditions.

It was learned at the Rubber Exchange of New York that a committee had been appointed to study in detail the government's method in Malaya of taxation of the rubber industry and to recommend any change deemed advisable.

RUBBER EXCHANGE ACTIVITIES

Week Ended	Transactions: Contracts Sold: Number	Transactions: Contracts Sold: Tons	Transferable Notices	Week End Tone
Aug. 29	445	1,112.5	47	Steady
Sept. 5	349	872.5	44	Easier
Sept. 12	345	862.5	77	Easy
Sept. 19	459	1,147.5	10	Easy
Totals	1,598	3,995.0	178*	

* Actual deliveries of rubber.

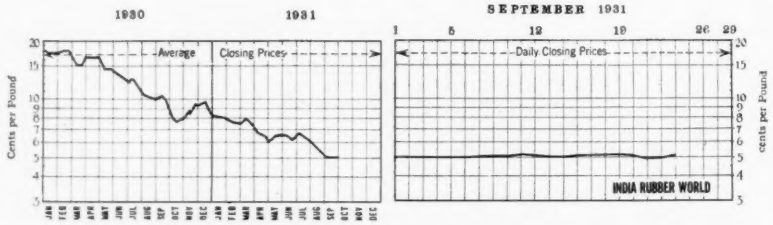
Every time new restriction plans come to the fore, however, arguments against restriction, also arise. The feeling in some quarters is that artificial efforts will do no more than fail in the long run; so it is best that natural forces take their ordinary course.

The idea is sound enough, perhaps, but no one can long overlook the tremendous losses suffered by British investors who have their money tied up in rubber company securities. Each drop in prices means a loss of large sums of money to these investors, and it is only natural that they should clamor for quick action to save the remnants of their capital.

If production would only show signs of decreasing or consumption of increasing, the arguments of those advocating no artificial aid would be strengthened. But with production maintained at high levels and consumption at a low level, the urgent demands of interested investors may result in the formation of another attempt at restriction by law or by mutual agreement.

Prices at the close of September 12 on the No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Sept.	...	...	5.15/5.20	5.32
Oct.	...	...	5.18	5.34
Nov.	...	...	5.20	5.37
Dec.	5.32	5.23	5.23	5.40
Jan.	...	...	5.29	5.47
Feb.	...	...	5.36	5.54
Mar.	5.52	5.39	5.43	5.62
Apr.	...	...	5.50	5.69
May	5.62	5.57	5.57/5.60	5.76/5.77
June	...	...	5.64	5.85*
July	5.85	5.78	5.72	5.94*
Aug.	...	...	5.82	6.04
Spot	...	...	5.18	5.35



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	August, 1931							September, 1931														
	24	25	26	27	28	29	31	1	2	3	4	5*	7*	8	9	10	11	12	14	15	16	17	18	19
Ribbed Smoked Sheet	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5	5	5	5	...	...	5 1/16	5 1/16	5 1/16	5 3/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16
No. 1 Thin Latex Crepe	5 5/16	5 5/16	5 5/16	5 1/2	5 1/2	5 1/2	5 1/2	5 1/16	5 1/16	5 1/16	5 1/16	...	...	5 1/2	5 1/2	5 5/16	5 3/4	5 5/16	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 3/8
No. 1 Thick Latex Crepe	5 5/16	5 5/16	5 1/2	5 5/16	5 5/16	5 3/8	5 3/8	5 1/16	5 1/16	5 1/16	5 1/16	...	...	5 1/2	5 1/4	5 3/8	5 1/2	5 3/8	5 1/4	5 1/4	5 1/4	5 3/8	5 3/8	5 1/4
No. 1 Brown Crepe	4 3/4	4 3/4	4 7/8	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	...	...	4 3/4	4 7/8	4 7/8	5	4 7/8	4 7/8	4 3/4	4 3/4	4 7/8	4 7/8	4 7/8
No. 2 Brown Crepe	4 3/4	4 3/4	4 3/4	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	...	...	4 5/8	4 3/4	4 3/4	4 7/8	4 3/4	4 3/4	4 5/8	4 5/8	4 3/4	4 3/4	4 3/4
No. 2 Amber	4 7/8	4 7/8	4 7/8	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	...	...	4 3/4	4 7/8	4 7/8	5	4 7/8	4 7/8	4 3/4	4 3/4	4 7/8	4 7/8	4 7/8
No. 3 Amber	4 3/4	4 3/4	4 3/4	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	4 5/8	...	...	4 5/8	4 3/4	4 3/4	4 7/8	4 3/4	4 3/4	4 5/8	4 5/8	4 3/4	4 3/4	4 3/4
No. 4 Amber	4 5/8	4 5/8	4 5/8	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	...	...	4 1/2	4 5/8	4 5/8	4 3/4	4 5/8	4 5/8	4 1/2	4 1/2	4 5/8	4 5/8	4 5/8
Rolled Brown	4 3/8	4 3/8	4 3/8	4 1/4	4 1/4	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	...	...	4 3/8	4 3/8	4 1/2	4 5/8	4 3/8	4 1/2	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8

*Holiday.

Week ended September 19. In a narrow market prices declined from 10 to 13 points for the week. The influence of the stock and the cotton markets was toward lower prices; cables from London were weaker; and large shipments are again indicated from Malaya.

For September it is estimated that 43,000 tons will be shipped from Malaya. For the first half of the month shipments totaled 21,000 tons. For August the figure was 42,832 tons, and for July, 43,658 tons. In September, 1930, shipments totaled 48,529 tons.

Dealers' stocks of crude rubber in the Far East amounted to 42,393 tons on a dry weight basis at the close of August, according to a cable received by the Rubber Exchange. At the end of July these holdings were 42,649 tons, compared with 41,313 tons at the end of August, 1930.

At Singapore and Penang the Harbor Board stocks dropped to 5,617 tons at the end of August, compared with 7,372 tons at the end of July and 5,877 tons at the close of August last year.

Reduced rubber production on Far Eastern estates is believed to have played a part in the stock reductions. July production is variously estimated by London authorities to have decreased from 13 to 16 per cent.

Restriction efforts are still under way, according to another cable. Rubber growers in Java, Dutch East Indies, have taken steps to enlist the cooperation of British interests in a restriction plan.

At a meeting of the Planters Association to be held on September 19, appointment of a committee will be proposed to work out with government assistance, "practical plans to establish a restriction scheme," said the cable. "The proposed committee will be instructed to communicate immediately with similar organizations in Ceylon and the Malaya States, the British rubber producing territories."

Prices at the close of September 19 on the No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Sept.	4.98	4.98	4.95	5.05
Oct.	...	...	4.98	5.07
Nov.	...	...	5.01	5.09
Dec.	5.08	5.08	5.04	5.12/5.17
Jan.	...	...	5.10	5.18
Feb.	...	...	5.16	5.25
Mar.	5.25	5.25	5.22/5.25	5.32/5.33
Apr.	...	...	5.28	5.37
May	5.38	5.38	5.35/5.37	5.43/5.47
June	...	...	5.41	5.51
July	5.50	5.48	5.48/5.50	5.59/5.62
Aug.	...	...	5.57	5.69
Spot	...	...	5.05	5.12

On September 21 new record lows were reached on news of suspension of gold payments by the Bank of England. December contracts hit 4.78 cents and closed at 4.85. Standard contracts were 13 to 20 points lower on future positions. The following day only 220 long tons were traded. The market was dull, and operators seemed to be waiting for more definite developments from England. Far Eastern estate production figures showed a slight decline. A sudden burst of confidence seemed to hit all markets, on September 23, and rubber became much steadier, even advancing to some extent. The cue was taken from the stock market, which rose sharply.

On September 24 ribbed smoked sheets No. 1 Standard contract closed at 4.85 cents nominal, a decline of 17 points from the previous day's close. Prices on the 25th were weaker, and in the morning session spot standard ribs were quoted at 4.6 cents.

Price Differentials

Price differentials between the various grades of plantation rubber which shall prevail on all deliveries against the old "A" contracts, for October, 1931, are: off quality first latex crepe at one-tenth of a cent (.1c.) per pound; good f. a. q. ribbed smoked sheets at two-tenths of a cent (.2c.) per pound; ordinary f. a. q. ribbed smoked sheets at thirty-five one-hundredths of a cent (.35c.) per pound.

N. Y. Outside Market

Since automobile manufacturers take such a large proportion of the rubber imported into the United States, it is only natural that curtailed activity in the automotive industry should be reflected in the rubber market. The fact that automobile output for the first 8 months of 1931 is 27 per cent behind that in the same period of last year means that considerably less rubber has been bought. Not only has consumption decreased, however, but rubber production has increased.

That statement, of course, does not tell the whole story, because tire replacement demand must be considered. Tire manufacturers estimate that production will be about the same as last year, but the actual consumption figures show that little rubber is being taken at present. Consumption for August and September combined probably will not exceed 43,000 tons.

Following the example of the United

New York Quotations

Following are New York outside market rubber quotations for one year ago, one month ago, and September 26, the current date

Plantation Hevea	September 26, 1930	August 27, 1931	September 26, 1931
Rubber latex (Hevea) ...gal	$0.75 @$0.90	$0.75 @	$0.75 @
Sheet			
Ribbed, smoked spot	.07¾ @	.05 7/16 @.05 7/16	.04 7/8 @.05
September	.07⅞ @	@	.04⅞ @.05
October-December	.08⅛ @	.05 9/16 @.05¼	.05 @.05⅛
January-March	.08¼ @	.05 7/16 @	.05⅛ @.05¼
April-June	.08⅜ @	.05⅝ @	.05¼ @.05⅜
CREPE			
No. 1 Thin latex (first latex) spot	.08¼ @	.05¾ @	.05¾ @.05½
September	.08½ @	@	.05⅝ @.05½
October-December	.08½ @	.05 7/8 @	.05½ @.05¾
January-March	.08¾ @	.06⅛ @	.05¾ @.05¾
April-June	.09 @	.06⅛ @	.05¾ @.05⅞
No. 2 Amber, spot ("B" blanket)	.07½ @	.05 @	.04⅝ @.04¾
September	.07½ @	@	.04⅝ @.04¾
October-December	.07½ @	.05⅞ @	.04¾ @.04⅞
January-March	.07¾ @	.05 7/8 @	.04⅞ @.05
April-June	.08 @	.05 1/16 @	.05 @.05⅛
No. 3 Amber, spot ("C" blanket)	.07¼ @	.04⅞ @	.04½ @.04⅝
No. 1 Brown, clean, light thin	.07½ @	.05 @	.04⅝ @.04¾
No. 2 Brown, clean, thin	.07⅜ @	.04 13/16 @	.04½ @.04⅝
Brown, roll	.07 @	.04½ @	.04⅜ @.04¾
East Indian			
PONTIANAK			
Banjermasin	.06 @	@	.07 @
Pressed block	.12 @	.08½ @	.09½ @
Sarawak	.06 @	@	.07 @
South American			
PARAS			
Upriver, fine	.11 @	.07¼ @	.05¾ @
Upriver, fine	*14¾ @	*.11 @	*.10 @
Upriver, coarse	.06¼ @	@	.05 @
Upriver, coarse	*.10 @	*.07½ @	*.05½ @

South American	September 26, 1930	August 27, 1931	September 26, 1931
PARAS—*Continued*			
Islands, fine ...gal.	$0.10½ @	$0.08 @	$0.05½ @
Islands, fine	*.14½ @	*.11½ @	.09¾ @
Acre, Bolivian, fine	.11¼ @	.08¼ @	.06¼ @
Acre, Bolivian, fine	*.15 @	*.12¾ @	*.10¼ @
Beni, Bolivian	.11¼ @	@	.06¼ @
Madeira, fine	.11 @	.08 @	.05⅞ @
CAUCHO			
Upper caucho ball	.06 @	@	.04½ @
Upper caucho ball	*.10¼ @	*.07 @	.05½ @
Lower caucho ball	.05¼ @	@	.04 @
Manicobas			
Ceará, negro heads	@	@	@
Ceará scrap	@	@	@
Manicoba, 30% guaranteed	@	†.04 @	†.04 @
Mangabiera, thin sheet	@	†.04 @	†.04 @
Guayule			
Duro, washed and dried	.15 @	.14 @	.14 @
Ampar	.16 @	.15 @	.15 @
Gutta Percha			
Gutta Siak	.12¼ @	.10¾ @	.10¾ @
Gutta Soh	.25 @	.16¾ @	.20 @
Red Macassar	2.00 @	1.75 @	2.00 @
Balata			
Block, Ciudad Bolivar	.38 @	.27 @	.26 @
Colombia	.33 @	@	@
Manaos block	.39 @	.27 @	.26 @
Surinam sheet	.58 @	@	.50 @
Amber	.62 @	@	.52 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal.

States Steel Company, two large companies immediately adjusted their wage scales; one announced a 10 per cent cut in hours and salaries of salaried employes, and the other put all workers on a 5-day week with corresponding adjustments of wages. These two are leaders in the field; so it is expected that other manufacturers will follow their example.

Curiously enough, the stock market reacted favorably to these wage cuts that had been impending for some time, feeling that it was a necessary measure to be taken before the industry could be put on a sound basis. Sentiment was almost cheerful after the news was out.

What developments will be in the next few days or weeks is hard to forecast. Commodity prices have steadied and even showed a slight increase for August. Whether this portends a change for the better, may be revealed in the next few weeks.

Week ended August 29. The low prices in actuals reached during the week attracted their quota of buyers, but to no unusual degree. Manufacturers are in no hurry to stock up because the outlook for the next few months, if not longer, is for prices around present levels.

The reason for this belief, of course, is the high rate of shipments and the large stocks on hand. A restriction scheme, if put into effect, might alter the picture; but after doing without such a scheme for so long, some traders favor letting events take their course.

It appears that the present level of prices will be disastrous to a number of growers, and that after a period of readjustment the growers should be in a sounder position than heretofore. While the heavy and indiscriminate tapping by natives is flooding the market with rubber at the present time, this method of forcing the trees will undoubtedly have an effect on later production.

Stocks at Liverpool are expected to show an increase of 900 tons for the week. This fact, together with the unsettled political situation, has largely been responsible for the bearish cables from London. But the announcement on Saturday that American and French bankers had extended a credit of $400,000,000 to the British government for one year may bolster up sentiment.

Prices at the close of August 29 were:

Spot	Aug. 29	Month Ago	Year Ago
Crepe	5½	6⅜	10¼
Ribs	5⅛	5⅞	9⅞
Upriver fine	7⅛	8¾	13¼

Week ended September 5. With this week ending the summer vacation season, and with a triple holiday over the week-end, activity was small in the outside market. The routine buying for actual requirements was in evidence, but not much more than that.

The rubber market held its own for the week in the face of weakness in stock, wheat, and foreign markets. London cables were mostly lower but little affected prices.

The most important statistical development was that shipments from Malaya were less than the estimates. For August the total was 42,832 tons, compared with 43,658 tons in July, and 47,802 tons during August, 1930. There is quite a strong opinion prevailing that at present prices rubber is losing money for growers, and more favorable figures should be shown in the next few months.

Ceylon shipments amounted to 3,756 tons, compared with 4,212 in July, and 6,701 in August, 1930.

Retail automobile sales for July were 23.5 per cent less than those a year ago, according to R. L. Polk & Co., compilers of the official registration figures. July sales were 194,388, against 201,911 in June, and 254,098 in July last year. For the first 7 months retail sales were 1,371,518, or 28.1 per cent below the 1930 figure of 1,907,617 and 33.2 per cent below the 5-year average of 2,050,997.

Prices at the close of September 5 were:

Spot	Sept. 5	Month Ago	Year Ago
Crepe	5¼	6	9¾
Ribs	5	5½	9
Upriver fine	7⅛	8¼	13

Week ended September 12. In the short week just passed prices climbed for a substantial gain but reacted toward the latter part of the week. Traders sold no unusual amounts of rubber, although a sizeable quantity changed hands on Friday, the biggest day of the week.

The release of the August rubber consumption figures also proved disappointing. Consumption of 27,586 tons compared with 31,937 tons consumed in July and 30,575 tons consumed in August last year.

It is generally conceded that the high production rate prevailing in spite of falling prices is due to the output on smaller estates. Trees have been tapped recklessly; general upkeep has been neglected; owners discharge their helpers and do the tapping themselves; and others pay according to the quantity of rubber tapped, regardless of what damage is done to the trees. In the future these practices will be reflected in lower output, but at present they serve only to explain a trend which is at the root of falling prices.

Prices at the close of September 12 were:

Spot	Sept. 12	Month Ago	Year Ago
Crepe	5⅝	5⅞	8⅜
Ribs	5⅛	5⅜	8
Upriver fine	7¼	8½	12¾

Week ended September 19. Brokers now seem to believe that the low prices reached on the stock market are rock bottom prices, but the decline registered in the past week only added to the pessimism prevailing. Political conditions are largely responsible for the unsettled conditions, and apprehension over what will happen to England's coalition government sent English bonds to the lowest levels in some time.

Commodity markets were strongly affected by the stock markets, of course, and rubber was no exception. But trading in rubber was dull. Buyers are not accumulating rubber because prices are all in their favor. Most of the sales were made at 5 1/16 to 5⅛, with dealers asking 5¼.

The August report of the Rubber Manufacturers Association showed consumption at 27,586 tons, compared with arrivals of 38,379 tons. Stocks on hand in the United States were put at 240,816 tons, and stocks afloat at 61,469 tons.

Shipments from Malaya for the first half of September were 21,000 tons, and the total for the month is expected to be about 43,000 tons.

Automobile production is still declining. The *Times'* index for the week ended September 12 was 45.3, compared with 46.7 for the preceding week, and 63.1 for the corresponding week last year. Cram's Automotive Report put actual output for the week ended September 12 at 41,226 units, compared with 42,486 for the preceding week, and 55,965 for the week ended September 11, 1930. The trend gives indications of continuing downward for the next few weeks unless the renewed activities by one of the largest producers of low-priced cars turns the index upward.

Prices at the close of September 19 were:

Spot	Sept. 19	Month Ago	Year Ago
Crepe	5⅜	5⅝	8¼
Ribs	5⅛	5¼	8
Upriver fine	6⅝	8½	12½

On September 21 buyers held aloof from the market on the news from England of suspended gold payments. The next day the market held steady at around 5 cents for nearby rubber. It was a rather dull session, with buyers just biding their time. On September 23 the drop in the value of exchange was offset by somewhat better prices.

Actuals on September 24 were quoted 5⅛ cents for spot standard ribs, with very little consumer buying in evidence. On the 25th prices declined ¼-cent on every grade. Offers of spot ribs at 4¾ cents excited little consumer interest.

Rubber Exchange Nominations

The annual election of the Rubber Exchange of New York, Inc., will be held on October 20, when officers will be chosen to serve for one year. The list of nominations follows:

For president, John L. Julian, of Fenner & Beane; vice president, William A. Overton, with Geo. H. McFadden & Bro.; treasurer, J. Chester Cuppia, of E. A. Pierce & Co.

The retiring Board of Governors is renominated, excepting three members in whose place the following were nominated: Frank D. Pressinger, rubber broker; Marcus Rothschild, of M. Rothschild & Co., Inc., and Robert L. Baird, with Henry Hentz & Co.

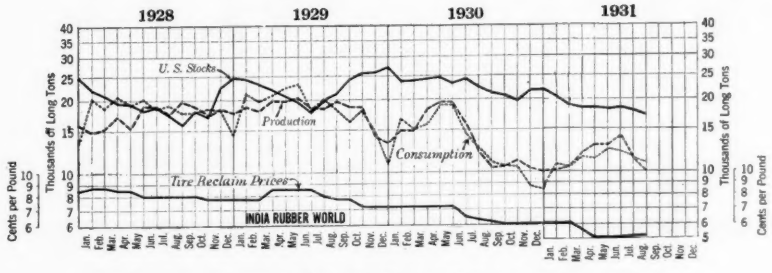
Other members of the Board of Governors who have been renominated are: Harry A. Astlett, Harold L. Bache, William E. Bruyn, James T. Bryan, Fred Pusinelli, Clinton T. Revere, Charles Slaughter, Edward J. Wade, and Charles T. Wilson.

The following are named as inspectors of election: LeRoy Wood, Nelson S. Robinson, and Benjamin B. Millenthal.

New Rubber Colors

A new series of specially processed colors for rubber work has recently become available. This group of colors consists chiefly of reds and yellows in a wide variety of shades. They are distinguished mainly by great tinctatorial strength, good light fastness, and ability to withstand the processes of vulcanization.

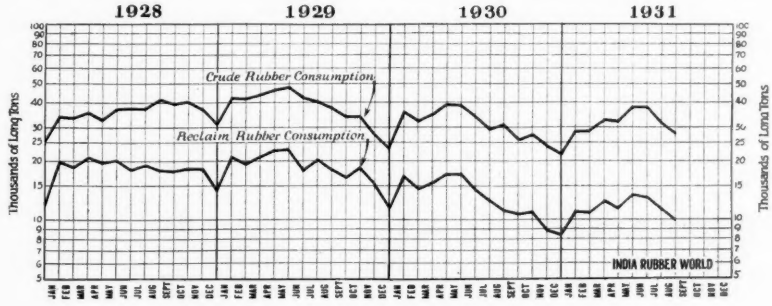
Reclaimed Rubber



Production, Consumption, Stocks, and Price of Tire Reclaim

THE statistical record of reclaim for August shows that production was 10,110 tons as compared with 11,393 tons for July, and consumption 9,972 tons as compared with 11,447 for July. The consumption of crude in August is given as 27,586 tons. These consumption figures indicate that the ratio of reclaim to crude entering finished rubber products was 36.1 per cent. This ratio is .3 per cent higher than the ratio reported for July.

As pointed out last month in this column the steady maintenance of this ratio for the past several months, during which period the price of reclaim and crude have both been at the five-cent level, is convincing evidence of the practical esteem in which manufacturers of rubber goods hold the economic worth of reclaim.



Crude and Reclaimed Rubber Consumption

It has recently been pointed out[1] that the acceptance of reclaim in specification goods is due to the recent improvement in quality and uniformity of products made from reclaimed rubber and to the development and widespread use of accelerated aging tests which enable the consumer to estimate the comparative durability of rubber products.

The use of reclaim in unspecified rubber goods is well maintained purely for its practical working qualities quite apart from any question of its pound cost relative to that of crude. Thus it is used in heavy proportions in mixings for footwear, topping, code wire, heels and soles, proofing, mats, matting, molded specialties, etc.

Production has been decreasing since the peak of 14,066 tons in June until in August it was 10,110 tons, which decrease makes the August production 1,048 tons less than that of August one year ago. The production for the first 8 months of this year was 96,583 tons compared with 114,850 tons for the corresponding period of last year. These figures show that the average monthly production from January to August this year was practically 16 per cent less than in the same months in 1930. This decrease is attributable to the general depression of business and will disappear with general trade revival.

Quotations on the standard grades of reclaim are essentially unchanged from those reported one month ago. The only changes noted are declines of ¼-cent a pound applying to both dark gray and white grades of auto tire reclaims.

[1]Circular of the Bureau of Standards No. 393.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1930	157,967	153,497	41.5	24,008	9,468
1930					
January	13,902	15,766	45.8	24,241	954
February	14,676	14,012	45.5	24,241	1,203
March	16,115	14,669	43.2	24,415	1,048
April	16,511	16,269	43.0	24,592	740
May	16,496	16,411	43.7	23,356	939
June	14,581	13,534	41.6	24,484	641
July	11,411	11,918	42.3	22,477	778
August	11,158	11,321	35.9	21,636	807
September	10,588	10,787	41.4	20,704	656
October	11,437	11,038	39.3	19,912	572
November	10,895	9,075	37.5	22,000	437
December	10,197	8,697	39.3	22,000	693
1931					
January	10,460	11,003	37.6	20,466	649
February	10,871	10,800	37.5	18,878	625
March	12,938	12,524	38.2	18,375	752
April	13,267	11,745	35.2	18,356	577
May	13,478	13,103	34.6	18,088	798
June	14,066	13,045	34.4	18,505	703
July	11,393	11,447	35.8	17,720	414
August	10,110	9,972	36.1	17,165	...

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

New York Quotations

September 26, 1931

	Spec. Grav.	Price Per Pound
High Tensile		
Super-reclaim, black	1.20	$0.06¼ @ $0.06½
red	1.20	.06 @ .06¼
Auto Tire		
Black	1.21	.04¾ @ .05
Black selected tires	1.18	.05 @ .05¼
Dark gray	1.35	.05¾ @ .06
White	1.40	.06½ @ .06¾
Shoe		
Unwashed	1.60	.05½ @ .05¾
Washed	1.50	.06½ @ .06¾
Tube		
No. 1	1.00	.07 @ ...
No. 2	1.10	.05¾ @ .06
Truck Tire		
Truck tire, heavy gravity	1.55	.05½ @ .05¾
Truck tire, light gravity	1.40	.05¾ @ .06
Miscellaneous		
Mechanical blends	1.60	.04 @ .04½

Tensile Rises With Reclaim

Tests on cotton jacketed fire hose that has been in long service have indicated, to the surprise of many, that a fair percentage of reclaim in the rubber tube compound is a marked advantage instead of the reverse. While tubing in which pure rubber alone has been used showed a much higher tensile in the first year or two; tubing, however, containing a moderate amount of good reclaim made in the third, and particularly in the fourth, year a much better tensile showing than tubing from which reclaim was excluded.

Compounding Ingredients

CONSUMPTION of compounding ingredients in September was less than in August, chiefly because of the further reduction of output by large tire manufacturers. It is estimated that tire production in the Akron district now approximates 40 per cent of its normal capacity.

Activity in rubber manufacturing for the automotive industry is limited in large degree to replacement requirements and is rather dull except in brake linings and battery boxes, production of which is decidedly active. The outlet for compounding materials is only moderate for other rubber goods such as footwear, insulated wire, and general mechanical goods. In New England rubber goods production is rated fairly active. This action, however, has ceased to be a factor in tire production.

ACCELERATORS. The popular brands of accelerators are in steady demand. An accelerator of some sort is a virtual necessity for economy and good work in essentially all rubber goods production. It follows that the trade tendency favors those accelerators that are best adapted to universal application.

AGE RESISTERS. Competition to secure in rubber goods the essential element of durability in service is the factor that maintains activity in the demand for age resisters. Their selective use is essential for best results since some of them prevent deterioration by retarding oxidation of rubber substance; others eliminate its breakdown by fatigue of flexing; while still others protect the surface against sun cracking.

CARBON BLACK. The standard rubber grade continues to be quoted at 3 cents f. o. b. Texas in carload lots. Its movement into tire and mechanical rubber goods production is below the usual seasonally slow but steady rate.

LITHARGE. September business was very dull, with practically no gain worthy of mention. The price holds steady at 6¾ cents a pound in casks.

LITHOPONE. Consumption has been slow all summer, with prices unchanged.

RUBBER SOLVENT. Early the past month the price was weak at 4¾ cents in tank cars. About September 7 mid-continent refiners were reported out of the market. On the 21st they were offering both light and heavy grades at 5¾ cents a gallon. Eastern prices were unchanged.

SOFTENERS. Stearic acid was in fair demand, and prices steady. The same was true of pine tar. Early in the month the market for Degras was quiet, but improved demand was noted later for high grade commercial quality.

ZINC OXIDE. Consuming demand on the part of the rubber trade was slow, and buying was limited to actual requirements.

New York Quotations

September 26, 1931

Prices Not Reported Will Be Supplied on Application

Abrasives			
Marble flour	ton	$14.00	@$16.00
Pumice	lb.	.03	@
Rottenstone, domestic	ton	23.50	@ 28.00
Rottenstone, English	lb.	.03¼	@
Silica, spot, l. c. l.	lb.	.01¼	@ .05
Accelerators, Inorganic			
Lead, carbonate	lb.	.07¼	@
red	lb.	.07¼	@
sublimed blue	lb.	.06¼	@
sublimed white	lb.	.06¼	@
super-sublimed white	lb.	.06¼	@
Lime flour, hydrated	ton	20.00	@
Litharge, casks	lb.	.06¼	@
Magnesia, calcined, heavy	lb.	.04	@
carbonate	lb.	.06	@ .07
Orange mineral A.A.A.	lb.	.09¼	@
Accelerators, Organic			
A-1	lb.	.22	@ .27
A-5-10	lb.	.31	@ .36
A-7	lb.	.55	@ .65
A-11	lb.	.62	@ .75
A-16	lb.	.57	@ .65
A-19	lb.	.58	@ .75
A-32	lb.	.70	@ .75
Accelerator 49	lb.	.36	@ .41
Aldehyde ammonia	lb.	.65	@ .67
Altax	lb.		@
Barak	lb.		@
BLE	lb.		@
Butene	lb.		@
Captax	lb.		@
Crylene	lb.		@
paste	lb.		@
DBA	lb.		@
Di-esterex N.	lb.		@
Di-ethyl-amine, 100%	lb.		@
DOTG	lb.	.42	@ .47
DPG	lb.	.30	@ .35
Ethylidine aniline	lb.	.45	@ .46
Formaldehyde aniline anhydro	lb.	.37½	@ .38½
Grasselerator 808	lb.		@
833	lb.		@
Heptene	lb.		@
base	lb.		@
Hexamethylenetetramine	lb.	.58½	@ .59½
Hydrone	lb.		@
Lead oleate, No. 999	lb.	.12½	@
Witco	lb.	.10	@
Lithex	lb.		@
Methylene dianiline	lb.	.37½	@ .38½
Monex	lb.		@
Novex	lb.		@
Phenex	lb.	.65	@ .70
Pipsol	lb.	4.00	@ 4.50
Plastone	lb.		@
R-2	lb.	1.75	@ 2.15
base	lb.	4.50	@ 5.00
R & H 40	lb.	.40	@ .41
50	lb.	.40	@ .41
50-D	lb.	.40	@ .41
397	lb.	.75	@ .76
Retardex	lb.	.50	@
Safex	lb.		@
SPDX	lb.	.70	@ .75
Suner-sulphur No. 1	lb.		@
No. 2	lb.		@
Tensilac 39	lb.	.40	@ .42½
Thermlo F	lb.		@
Thiocarbanilid	lb.	.20	@ .22
TMTT	lb.	$3.00	@$3.25
Trimene	lb.		@
base	lb.		@
Triphenyl guanidine	lb.	.58	@ .60
Tuads	lb.		@
Ulto	lb.	3.00	@
Ureka	lb.	.70	@ 1.00
ZBX	lb.		@
Z-88-P	lb.	.50	@ .60
Zimate	lb.		@
Acids			
Acetic 28% (bbls.)	100 lbs.	2.60	@ 2.85
glacial (carboys)	100 lbs.	9.73	@ 9.98
Sulphuric, 66°	ton	15.50	@
Age Resisters			
Age-Rite Gel	lb.		@
powder	lb.		@
resin	lb.		@
white	lb.		@
Albasan	lb.		@
Antox	lb.		@
Oxynone	lb.	.68	@ .90
Resistox	lb.	.54	@ .65
Stabilite	lb.	.57	@ .59
Alba	lb.	.70	@ .75
VGB	lb.		@
Zalba	lb.		@
Alkalies			
Caustic soda, 76% solid	100 lbs.	2.50	@
Antisun Materials			
Heliozone	lb.		@
Sunproof	lb.		@
Binders, Fibrous			
Cotton flock, dark	lb.	.09	@
dyed	lb.	.50	@ .80
white	lb.	.11	@ .16
Colors			
BLACK			
Bone, powdered	lb.	.05½	@ .15
Carbon (see Reenforcers)			
Drop (bbls.)	lb.	.05½	@ .17
Lampblack (commercial)	lb.	.07	@ .08
BLUE			
Blue toners	lb.	.60	@ 3.85
Brilliant blue	lb.	3.50	@
Prussian	lb.	.35	@ .37
Ultramarine	lb.	.06	@ .30
BROWN			
Iron oxide	lb.		@
Mapico	lb.	.17	@
Sienna, Italian, raw	lb.	.04½	@ .11
GREEN			
Brilliant green	lb.	3.50	@
Chrome, light	lb.	.23	@ .25½
medium	lb.	.26	@ .27½
Chromium oxide	lb.	.24½	@ .32
Dark green	lb.	1.30	@
Green toners	lb.	1.00	@ 3.60
Light green	lb.	.70	@
ORANGE			
Cadmium sulphide	lb.	.60	@ .70
Orange lake	lb.	.50	@
Orange toners	lb.	1.60	@
ORCHID			
Orchid toners	lb.	1.05	@ 1.75
PINK			
Pink toners	lb.	1.00	@ 1.80
PURPLE			
Permanent purple	lb.	1.80	@
Purple toners	lb.	$0.60	@$1.90
RED			
Antimony			
Crimson, R. M. P. No. 3	lb.	.48	@
Sulphur free	lb.	.52	@
7-A	lb.	.35	@
Z-2	lb.	.22	@
Cadmium	lb.		@
Chinese red	lb.	.85	@
Crimson red	lb.	.85	@
Iron Oxides			
bright pure domestic	lb.	.09½	@ .12
bright pure English	lb.	.12	@
bright reduced English	lb.	.08	@
bright reduced domestic	lb.	.04	@ .08
Indian (maroon), pure domestic	lb.	.09½	@ .12
Indian (maroon), pure English	lb.	.10	@
Indian (maroon), reduced English	lb.	.08	@
Indian (maroon), reduced domestic	lb.	.03	@ .08½
Mapico	lb.	.09	@
Medium red	lb.	.85	@
Oximony	lb.		@
Red toners	lb.	.95	@ 2.75
Rub-er-red	lb.	.08¼	@
Scarlet red	lb.	1.50	@
Spanish red oxide	lb.	.02¼	@ .04
Sunburnt red	lb.	.13	@
Venetian red	lb.	.03	@
WHITE			
Lithopone	lb.	.04¾	@ .05
Albalith	lb.	.04½	@ .05
Azolith	lb.	.04½	@ .05
Cryptone	lb.	.06½	@ .07
Grasselli (50 lb. bags)	lb.	.04½	@ .04¾
(400 lb. bbls.)	lb.	.04¾	@ .05
Titanium oxide, pure	lb.	.20	@
Titanox "B"	lb.	.06½	@ .07
"C"	lb.	.07	@ .07½
Zinc Oxide			
AAA (lead free)	lb.	.06½	@ .07
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06¼	@ .06¾
Z (8% leaded)	lb.	.06¾	@ .06¾
Black label (lead free)	lb.	.06½	@ .07
Green seal	lb.	.10¾	@ .10¾
Green seal, Anaconda	lb.	.10¾	@ .10¾
Kadox, black label	lb.	.10¾	@ .10¾
blue label	lb.	.09¾	@ .09¾
red label	lb.	.08	@ .08½
Red label (lead free)	lb.	.06½	@ .07
Red seal	lb.	.09¾	@ .09¾
Red seal, Anaconda	lb.	.09¾	@ .09¾
Special	lb.	.07	@ .07½
White seal (bbls.)	lb.	.11¾	@ .11¾
White seal, Anaconda	lb.	.11¾	@ .11¾
XX green	lb.	.07	@ .07½
XX red	lb.	.06½	@ .07
Zinc sulphide (bbls.)	lb.	.15	@ .15½
YELLOW			
Cadmium sulphide	lb.	.65	@ .75
Chrome	lb.	.20	@
Lemon yellow	lb.	1.50	@
Mapico	lb.	.12	@
Ochre, domestic	lb.	.01¼	@ .02½
French	lb.	.03	@

New York Quotations

September 26, 1931

Prices Not Reported Will Be Supplied on Application

Oxide, pure	lb.	$0.08½	@
Yellow toners	lb.	2.50	@
Deodorant			
Rodo	lb.		@
Factice—See Rubber Substitutes			
Fillers, Inert			
Asbestine	ton	13.40	@13.50
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00	@
(f.o.b. St. Louis, 80 lb. paper bags)	ton	22.20	@
Barytes, white, spot	ton	32.00	@33.00
off color, spot	ton	24.00	@
Foam "A" (f.o.b. St. Louis)	ton	23.00	@
Basofor	lb.		@
Blanc fixe, dry	lb.	.04½	@
pulp	ton	42.50	@45.00
C-C-O white (f.o.b. St. Louis, bbls.)	ton	15.00	@
Infusorial earth	ton	35.00	@
Kieselguhr	lb.	.03½	@
Slate flour, gray (fac'y)	ton	6.00	@
Suprex white, extra light	ton	70.00	@80.00
Tripoli	lb.	.02	@
Whiting			
Chalk, imported	100 lbs.	.85	@ 1.00
Domestic	100 lbs.	1.00	@
Paris white, English cliffstone	100 lbs.	1.45	@ 3.50
Quaker	ton		@
Sussex	ton		@
Witco (l. c. l.) (f.o.b. New York)	ton	20.00	@
Wood flour	ton	25.00	@
Fillers for Pliability			
Flex	lb.		@
Fumonex	lb.	.02½	@ .06
P-33	lb.		@
Thermax	lb.		@
Velvetex	lb.	.02	@ .05
Finishes			
Mica, amber	lb.	.04½	@
Shellac, fine orange	lb.	.30	@
Starch, corn, pwd.	100 lbs.	2.57	@ 2.77
potato	lb.	.05½	@ .06
Talc, domestic	lb.	.01¾	@
dusting	lb.		@
French	ton	18.00	@22.00
Italian	lb.	.02½	@ .03
Pyrax A	ton		@
Inflating Material			
Ammonium carb., pwd.	lb.	.10¾	@
lump	lb.	.10	@
Sponge paste	lb.	.30	@
Mineral Rubber			
Fluxrite (solid)	lb.		@
Genasco (fact'y)	ton	40.00	@42.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Ohmlac Kapak. M. R. (f.o.b. fact'y)	ton	60.00	@
M. 4 (f.o.b. fact'y)	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Parmr Grade 1	ton	23.00	@28.00
Grade 2	ton	23.00	@28.00
Pioneer, M. R., solid (fact'y)	ton	40.00	@42.00
M. R. granulated	ton	50.00	@52.00
Robertson, M. R., solid (fact'y)	ton	32.00	@80.00
M. R. granulated	ton	35.00	@80.00
Mold Lubricants			
Rusco mold paste	lb.	.12	@ .30
Sericite	lb.		@
Soapbark (cut)	lb.	$0.07½	@$0.08
Soapstone	lb.	.01	@
Oils			
Castor	lb.	.12½	@
Kerosene	gal.	.09	@
Mineral	gal.	.20	@
Poppy seed oil	gal.	1.70	@
Rapeseed, blown	gal.	.70	@ .72
Red oil, distilled	lb.	.07⅞	@ .08¾
Rubber process	gal.	.25	@
Spindle	gal.	.30	@
Protective Colloids			
Bentonite (dispersion clay)	lb.	.02¼	@ .02½
Casein, domestic	lb.	.06½	@ .07½
Reenforcers			
Aluminum flake (sacks, c. l.)	ton	21.85	@
(sacks, l.c.l.)	ton	24.50	@
Carbon Black			
Aerfloted arrow	lb.	.03½	@ .07
Cabot's certified black	lb.	.03	@
Century (works, La., c. l.)	100 lbs.	3.00	@
Disperso (works, La., c. l.)	100 lbs.	3.00	@
Elastex	lb.	.03	@ .07
Excello	lb.	.03½	@
Gastex (f. o. b. fact'y)			
contracts	lb.	.02½	@
carload	lb.	.02½	@
less carload	lb.	.03¾	@ .04¼
Micronex	lb.	.03½	@ .07½
Ordinary (compressed or uncompressed)	lb.	.03½	@ .07½
Palmer gas black	lb.	.03	@
Supreme	lb.	.03	@
Clays			
Bento	lb.	.03	@
Blue Ridge, dark	ton		@
China	lb.	.01¼	@
Dixie	ton		@
Dusto	lb.		@
Langford	ton		@
Lexo (works)	ton	8.00	@
Par	ton		@
Perfection	ton	20.00	@
Suprex No. 1	ton	8.00	@
No. 2, dark	ton	6.50	@
Glue, high grade	lb.	.20	@ .25
Rubber Substitutes or Factice			
Amberex	lb.	.15	@
Black	lb.	.07	@ .11
Brown	lb.	.07	@ .12
Thiokol	lb.	.30	@
White	lb.	.08	@ .15
Softeners			
Burgundy pitch	100 lbs.	6.00	@
Atlas	100 lbs.	6.50	@
Corn oil, crude	lb.	.07	@ .07½
Cottonseed oil (P. S. Y.)	lb.		@
Cycline oil	lb.	.25	@ .34
Degras	lb.	.03½	@ .04½
Fluxol	ton	18.00	@80.00
Fluxrite (fluid)	lb.		@
Palm oil (Lagos)	lb.	.04⅞	@
(Niger)	lb.	.04	@
(Witco)	lb.	.07½	@
Para-flux	gal.	.15	@
Petrolatum, snow white	lb.	.07	@ .07¼
Pigmentar	gal.	.18	@ .23
Pigmentaroil (tank cars, factory)	gal.	.18	@
(bbls., drums)	gal.	.23	@
Pine oil, dest distilled	gal.	.54	@ .55
Pine pitch	bbl.	6.50	@ 7.00
Pine tar	gal.	.22	@
Rosin K (280 lbs.)	bbl.	$4.22½	@
Rosin oil, compounded	gal.	.35	@
No. 3, deodorized	gal.	.57	@
No. 556, deodorized	gal.	.48	@
Rubberseed, drums	lb.	.09	@ .09½
Rubtack	lb.	.10	@
Tackol	lb.	.09	@ .18
Tonox	lb.		@
Witco No. 20	gal.	.08	@
Woburn oil	lb.	.05½	@
Wobonite No. 94	lb.	.03½	@
Solvents			
Benzol (90% drums)	gal.	.23	@
Carbon bisulphide (drums)	lb.	.05½	@ .12
tetrachloride	lb.	.07	@
Dip-Sol	gal.		@
Dryolene, No. 9	gal.		@
Gasoline			
No. 303			
Drums, (c. l.)	gal.		@
Tank cars	gal.	.10	@
Petrobenzol	gal.		@
Rub-Sol	gal.		@
Solvent naphtha (tanks)	gal.	.24	@
Stod-Sol	gal.		@
Troluoil	gal.		@
Turpentine, Venice	lb.	.20	@
dest distilled	gal.	.36	@
Stabilizers			
Laurex, ton lots	lb.		@
Sta-Tex A	lb.		@
Stearates			
Aluminum	lb.		@
Calcium	lb.		@
Magnesium	lb.		@
Zinc	lb.		@
Stearex B	lb.	.08	@ .12
Stearex flake	lb.	.09	@ .13
Stearic acid, dbl. pres'd.	lb.	.08½	@ .09
Zinc laurate	lb.	.13½	@
Stearate	lb.	.20	@
Vulcanizing Ingredients			
Sulphur			
Rubber sulphur, 99½% superfine	100 lbs.	1.75	@ 2.50
(c.l.)	100 lbs.	2.20	@ 2.55
(l.c.l.)	100 lbs.	2.60	@ 3.10
Soft rubber, 100%			
(c.l.)	100 lbs.	2.60	@ 2.95
(l.c.l.)	100 lbs.	2.95	@ 3.50
Sulphur chloride	lb.	.03½	@ .04
Superfine commercial flour (bbls.)	100 lbs.	2.55	@ 3.10
(bags)	100 lbs.	2.20	@ 2.80
Tire brand, superfine	100 lbs.	1.75	@
Tube brand, velvet	100 lbs.	2.30	@
Velvet flour (240 lb. bbls.)	100 lbs.	2.95	@ 3.50
(150 lb. bags)	100 lbs.	2.60	@ 3.15
Telloy	lb.		@
Vandex	lb.		@
(See also Colors—Antimony)			
Waxes			
Beeswax, white, com	lb.	.55	@
carnauba	lb.	.33	@
ceresin, white	lb.	.12½	@
montan	lb.	.06½	@
ozokerite, black	lb.	.28	@
green	lb.	.28	@
Paraffin			
122/124 crude, white scale	lb.	.019	@
124/126 crude, white scale	lb.	.019	@
125/127 fully refined	lb.	.03	@ .03½

Ceylon Rubber Exports

January 1 to June 30, 1931

To	Tons
United Kingdom	6,752.48
Continent	3,351.43
Other countries in Europe	47.07
Australia	777.18
America	21,842.08
Other countries in America	236.55
Egypt	9.92
Africa	5.35
India	39.85
Japan	142.04
Other countries in Asia	3.00
Total	33,206.95
For the same period last year	37,074.81

Annual Exports, 1923-1930

	Tons
For the year 1930	75,602.18
1929	80,219.25
1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1931			
	1929	1930	May	June	July	Aug.
British Malaya						
Gross Exports	579,524	547,043	44,281	39,505	43,658	42,832
Imports	161,612	133,876	10,479	12,115	11,995	9,063
Net	417,912	413,167	33,802	27,390	31,663	33,769
Ceylon	80,795	76,406	4,242	5,098	*4,212	*3,764
India and Burma	11,720	10,782	622	1,086	715	....
Sarawak	11,079	10,310	869	1,138	801	692
British No. Borneo	7,381	7,052	*500	*500	*500	*500
Siam	5,024	4,349	413	337	316	210
Java and Madura	66,010	69,755	7,372	5,856	6,671	....
Sumatra E. Coast	87,589	79,396	6,799	6,697	7,510	....
Other N. E. Indies	134,732	115,254	10,955	11,381	10,711	....
French Indo-China	10,147	9,877	*702	*938	*841	*983
Amazon Valley	21,148	14,260	1,110	621	1,565	856
Other America	996	516	6	*5	*5	*5
Guayule	1,275	1,095	....	....	....	....
Africa	4,596	3,961	*300	*300	*300	*300
Totals	860,404	816,180	67,692	61,347	65,810	.....

*Estimate. *Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

Cotton and Fabrics

THE September crop report of the government was greater by 101,000 bales than that in August; so the doubt as to the accuracy of the figures has been removed almost completely. Private reports have been revised upward and averaged over 15,000,000 bales before the government report was issued.

In the light of developments in the South this large crop has much significance on their actions. Legislation in several states has been passed limiting next year's crop either entirely or to the extent of 50 per cent of this year's acreage.

Supposing that all the southern states adopt legislation similar to this and it is finally agreed that a 50 per cent cut can be effected next year. A few figures compiled by Geo. H. McFadden & Bro. in a recent report show an interesting picture.

1931-1932 Carryover	9,000,000
Present crop (conservatively)	15,000,000
Supply	24,000,000
Consumption	12,500,000
Carryover	11,500,000
50% acreage cut—probable crop	7,500,000
Supply 1932-1933	19,000,000
Consumption 1932-1933	14,500,000
Carryover	4,500,000

Just as the report says, these figures are entirely theoretical; but they should give pause to those who believe that a 50 per cent crop reduction movement would be a panacea for all the cotton farmer's ills.

Another disturbing fact is that American cotton is receiving keen competition from foreign growths. In former years American cotton reigned supreme in world markets, but last year sale of foreign growths exceeded that of American cotton.

Experience has shown, too, that restriction agreements are hard to enforce. The inclination is to let the other fellow do it. Question has been raised, moreover, as to the constitutionality of such measures. Many are skeptical that cotton farmers can legislate themselves out of their difficulties.

Week ended August 29. A good gain was shown in prices for the week, with most of the advance registered on Monday morning. News that the MacDonald government had fallen in Britain gave rise to the belief that a higher tariff would soon be imposed, thus protecting the cotton manufacturers within the isle.

Crop weather was responsible for maintaining the more steady tone. Heavy and continued showers were reported in the cotton belt, and the delay they have caused in harvesting and ginning the cotton in the fields was interpreted favorably.

A private report issued during the week put the condition of the crop at 67.1 per cent, compared with a condition of 70.6 a month ago. This report also forecast a crop of about 15,512,000 bales. Following the government report in the middle of the month, it is expected that many private reports will have figures that have been revised upward.

The Louisiana House passed a bill to prohibit planting, harvesting, or ginning cotton next year, with a penalty of from $100 to $500 to any grower violating the measure; and the State Commissioner of Agriculture has the power to destroy any cotton found growing in the field.

The bill sponsored by Governor Huey P. Long, was passed by a unanimous vote of 77 to 0. The adoption of the measure was contingent on similar action by other states. It was expected that the bill would find quick acceptance in the Senate and that other legislatures would pass similar legislation. Governor Long predicted that if all the cotton growing states followed the example of Louisiana, the price of cotton would soon be up to 15 or 20 cents.

Later in the week several senators conferred privately with the Farm Board about probable methods of relieving the cotton farmer's heavy burden.

Prices at the close of August 29 were:

Position	High	Low	Close	Previous Close
Oct.	7.22	7.06	7.20/21	7.12/13
Dec.	7.45	7.29	7.40/41	7.33/34
Jan.	7.55	7.40	7.51	7.44
Mar.	7.74	7.60	7.70/71	7.64
May	7.93	7.77	7.87/88	7.80/81
July	8.08	7.96	8.06	8.00

Week ended September 5. About a ½-cent drop was registered by cotton for the past week. The largest drop, about a ¼-cent, came on Monday when favorable weather news and a lower tendency in wheat and stocks turned prices downward.

These same factors influenced the market for most of the week, in addition to low cables from Liverpool. Toward the end of the week hedge selling and liquidation developed, but the market was quiet in anticipation of the three-day holiday.

The government's report on crop conditions at August 31 is expected to be substantially the same as it was in its last report. Private estimates have averaged about 15,110,000 bales, with a condition of about 65.9 per cent.

The Farm Board announced early in the week that it would not buy any more cotton. A statement issued by the board said:

"The board has discovered, and hopes the American people have discovered, that continued purchases in the face of overproduction will not remedy the situation.

". . . Cotton stocks have accumulated over a period of four years, wheat stocks over six years. In the face of this condition, we think the board should make no more purchases."

The immediate reaction of the market to this statement was to lower prices $1 a bale, but recovery was made later on buying by the trade.

But efforts by southern growers to alleviate the burden of overproduction are continuing with growing force. Senator Joe T. Robinson outlined a plan, which was said to be the result of exhaustive study, whereby farmers would cut production 50 per cent next year and regulate their production for another 5 years. Pressure is also being brought upon Governor Sterling of Texas to call a special session of the legislature to enact a law similar to that passed in Louisiana. In spite of protests Governor Sterling to date has not called the legislature together.

Prices at the close of September 5 were:

Position	High	Low	Close	Previous Close
Oct.	6.79	6.64	6.64/65	6.75
Dec.	7.00	6.87	6.87/89	6.97/98
Jan.	7.09	6.96	6.96	7.06
Mar.	7.29	7.16	7.16/17	7.25/26
May	7.46	7.32	7.32/33	7.42/43
July	7.63	7.50	7.50	7.59/60

Week ended September 12. The government crop report issued Tuesday was awaited with keen interest by the trade. The figures revealed were about as expected, and the market registered a slight gain after the report was out.

The government figures put the crop at 15,685,000 bales, an increase of 101,000 bales above the August forecast, and the highest figure for September since 1915. Since the release of the unprecedented large August estimate, private reports have been revised upward and averaged about 15,100,000 bales for September.

The condition on September 1 was put at 68.0 per cent, compared with 53.2 per cent on September 1, 1930. The acreage estimate was 40,889,000 acres, compared with 40,129,000 acres in August.

Cotton of the present crop ginned to September 1 was said to have been 565,160 running bales, compared with 1,879,919 bales to the same date last year.

The changes in the cotton market for the week were slight. Variations were made on trade buying, southern selling, and in sympathy with the stock market

President Hoover outlined a program in-

COTTON BEAR POINTS

1. September government crop report was 101,000 bales higher than that for August.
2. Cotton consumed by American mills in the first 8 months of 1931 was 3,684,623 bales, compared with 3,717,281 in the same period last year.
3. Last season only 11,134,000 bales of American cotton were consumed in world markets, against 11,700,000 bales of foreign cotton.
4. The Farm Board will make no further stabilizing purchases.
5. Yarn and cloth sales in England are limited and may not equal output; mill activity is declining in France; the Near East and Russia are selling large amounts of goods at low prices.
6. Hedging gives evidence of becoming heavier as the crop is moved to market.
7. The weather on the whole has been favorable, as evidenced in the larger government crop estimate for September.
8. Suspension of gold payments by Great Britain may have a disturbing influence on business in the island.
9. The usual seasonal increase in cotton cloth sales has been slow in making itself evident.
10. Even a 50 per cent acreage cut next year would leave a large surplus at the end of next season.

COTTON BULL POINTS

1. Exports in the first 8 months of 1931 were 3,024,493 bales, against 2,893,557 in the same period last year.
2. "Stocks of cotton goods are at the lowest point since 1927," according to George A. Sloan, president of the Cotton Textile Institute.
3. Cotton acreage in Egypt for 1931 is expected to be about 19 per cent below that of 1930; acreage has also been reduced in India and China.
4. President Hoover acted to arrange for credits abroad so that foreign countries could purchase American cotton.
5. Farmers who have secured federal loans will be advanced $5 a bale for picking expenses.
6. Cotton in consuming establishments on August 31 was 839,850 bales of lint, compared with 994,979 on July 31, and 1,014,818 on August 31 last year.
7. Several southern states have passed measures curtailing next year's crop; legislation ranges from total restriction to a 50 per cent ban.
8. Cotton ginned prior to September 16 totaled 2,091,513 running bales, compared with 3,736,120 ginned to the same date last year.

tended to dispose of about 1,000,000 bales of cotton to foreign buyers. It was proposed that the cotton be sold on credit to European buyers, the credits to be arranged by private bankers. This action raised the market from 17 to 19 points on Wednesday, but selling in the South cancelled the gain the next day.

Governor Blackwood of South Carolina called an extra session of the legislature to discuss means for relief of the cotton farmer. The session will be limited to 10 days. In Texas mass meetings were held by the farmers to impress the legislature with their need of quick action.

Prices at the close of September 12 were:

Position	High	Low	Close	Previous Close
Oct.	6.75	6.60	6.60/61	6.70/71
Dec.	6.94	6.81	6.81/82	6.92/93
Jan.	7.02	6.90	6.90/92	7.01
Mar.	7.22	7.10	7.10/12	7.20
May	7.39	7.28	7.29/30	7.36/37
July	7.55	7.44	7.45/46	7.53/54

Week ended September 19. On every day, except one, prices were lower during the past week. The rise in prices on Tuesday was due largely to short covering, although a report that the Texas legislature favored a ⅓ restriction on the cotton crop added impetus to the short covering.

It is now apparent that the plan of Governor Long of Louisiana for complete suspension of all planting next year will not go through in the Texas legislature. The Texans resent what they call "ignorance, impudence, and insolence combined." From Governor O. Max Gardner of North Carolina a wire was received by a member of the Texas legislature in which His Excellency said he would call no extra session to consider cotton relief. In South Carolina a measure was passed in both houses for complete restriction, and latest reports from Texas was that a bill favoring 50 per cent restriction was gaining favor.

The falling raw material prices have adversely affected the cotton goods market, and sales are reported to be limited.

Cotton consumed in August was 425,819 bales, compared with 450,419 in July, and 352,626 in August last year. Exports for August totaled 211,030 bales, compared with 259,059 in July, and 366,036 in August, 1930.

The weather is still favorable to the crop; but picking, ginning, and marketing are far behind previous years. Heavy selling was in evidence in the last 2 days of the week, ascribed largely to increased hedging because of the favorable picking weather. The government has announced that farmers who have obtained federal loans will be permitted to borrow $5 a bale in addition, on the cotton in the warehouses, for use in meeting picking expenses.

The political situation in England adversely influenced both the cotton and the stock markets this week. English bonds hit new levels on Friday, and the stock market here as well as the cotton market receded sharply. On Saturday cotton prices were steadier in Liverpool, but hedge selling here offset the reports from abroad.

Prices at the close of September 19 were:

Position	High	Low	Close	Previous Close
Oct.	6.33	6.19	6.19/6.20	6.34/6.35
Dec.	6.54	6.40	6.40/6.42	6.56/6.57
Jan.	6.65	6.50	6.50/6.51	6.66
Mar.	6.82	6.68	6.68/6.69	6.84/6.86
May	6.99	6.88	6.89/6.90	7.02/7.04
July	7.18	7.25	7.05/7.06	7.20/7.22

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Aug. 29	7.12
Sept. 5	6.86
Sept. 12	6.75
Sept. 19	6.52

On September 21 the market reached new low grounds in a heavy day of trading following announcement that England had suspended gold payments. Operators bought in New York and sold in England. This action caused a rising market, but profit taking and uneasiness as to the course of events prompted a decline, with the market closing with losses of 4 to 9 points for the day.

The market was steadier the next day and closed 4 to 7 points higher. The price of middling cotton hit 5 cents, the lowest since 1899, in Little Rock on the 21st and continued at that price on the 22nd. October closed at 6.14 to 6.15.

On September 23 gains of 25 to 35 points were registered early in the morning, but profit taking cut 10 points from the advance. Buying was heavy, and cotton contracts were scarce. The advance of from 3 to 14 points in the stock market also had a favorable influence.

On September 24 cotton declined $1 a bale in late trading influenced by the stock market break. The October position closed at 6.2 cents a pound. On September 24 the spot market on middlings, quiet and fairly steady, closed 5 points down at 6.3 cents.

Cotton Fabrics

Ducks, Drills, and Osnaburgs. Some encouraging signs are appearing in the way of inquiries for round lots on contract basis for future delivery. The market, however, still lacks the momentum that usually characterizes late summer and autumn business. The recessions in fabric prices have outrun those in raw material, causing unsatisfactory conditions in some cotton fabric lines. More restraint is observed in price cutting; and as mill products reach bargain rates, there will be less occasion to cut prices.

Raincoat Fabrics. A decided improvement has become evident in the raincoat trade in the past fortnight. This condition is expected to increase as the best season is at hand. As in other lines of trade, business is being conducted on so scant a margin as to virtually amount to loss in many cases.

Sheeting. The usual seasonal buying movement customary about the middle of September is delayed because of unstable conditions in the outside market. It is the opinion in the trade that the current low prices will stimulate consumption.

Tire Fabrics. Slackness in tire production and the decline in the cotton market have caused buyers to become very cautious in committing themselves for future needs. They are consequently covering only for immediate needs.

Celanese. This attractive material in solid colors and designs is gaining in popularity for raincoats to suit every purse. It is also becoming popular for bath curtains in tones to harmonize with the decorative scheme of bathrooms.

New York Quotations

September 26, 1931

Drills

38-inch 2.00-yard	yd.	$0.09¾@
40-inch 3.47-yard		.05¾@
50-inch 1.52-yard		.13 @
52-inch 1.90-yard		.10¼@
52-inch 2.20-yard		.09½@
52-inch 1.85-yard		.10⅞@

Ducks

38-inch 2.00-yd. D. F.	yd.	.10 @
40-inch 1.45-yard S. F		.14 @
72-inch 1.05-yard D. F		.20 @
72-inch 16.66-ounce		.23¼@
72-inch 17.21-ounce		.24 @

MECHANICAL

Hose and belting	lb.	.21 @

TENNIS

52-inch 1.35-yard	yd.	.15 @

Hollands

RED SEAL

36-inch	yd.	.12½@
40-inch		.13 @
50-inch		.19 @

GOLD SEAL

40-inch, No. 72	yd.	.15 @

Osnaburgs

40-inch 2.35-yard	yd.	$0.08¼@
40-inch 2.48-yard		.08 @
40-inch 3.00-yard		.06¾@
40-inch 10-oz. part waste		.09 @
40-inch 7-oz.		.06¼@
37-inch 2.42-yard		.08¼@

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yd.	.08¾@
Bombazine 60 x 48		.07¾@
Plaids 60 x 48		.10¼@
Plaids 48 x 48		.09¼@
Surface prints 64 x 60		.10¾@
Surface prints 60 x 48		.10¾@
Print cloth, 38½-in., 60 x 48		.03½@
Print cloth, 38½-in., 64 x 60		.04 @

CELANESE, dyed and finished

Permanent Moire	yd.	.90 @
Faille		.80 @
Taffeta, 84 x 60		.45 @
Taffeta, 104 x 76		.52½@
Taffeta, 200 x 64		.80 @

SHEETINGS, 40-INCH

48 x 48, 2.50-yard	yd.	.05⅞@
48 x 48, 2.85-yard		.05½@
64 x 68, 3.15-yard		.06⅛@
56 x 60, 3.60-yard		.05¼@
44 x 48, 3.75-yard		.04¼@
44 x 40, 4.25-yard		.03⅞@

SHEETINGS, 36-INCH

48 x 48, 5.00-yard	yd.	.03½@
44 x 40, 6.15-yard		.02⅞@

Tire Fabrics

BUILDER

17¼ oz. 60" 23/11 ply Karded peeler	lb.	.23 @
17¼ oz. 60" 10/5 ply Karded peeler	lb.	.21 @

CHAFER

14 oz. 60" 20/8 ply Karded peeler	lb.	.23 @
12 oz. 60" 10/4 ply Karded peeler	lb.	.19 @
9¼ oz. 60" 20/4 ply Karded peeler	lb.	.25 @
9¼ oz. 60" 10/2 ply Karded peeler	lb.	.21 @

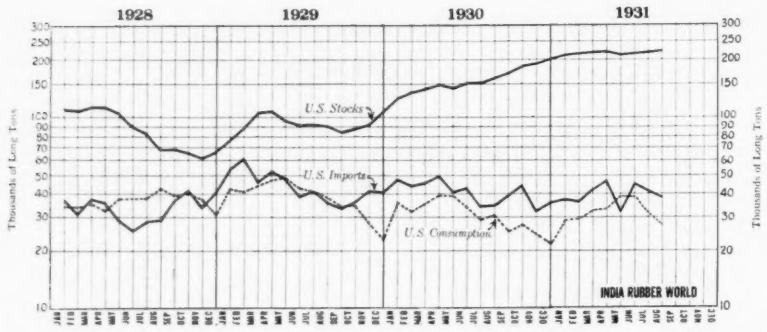
CORD FABRICS

23/5/3 Karded peeler, 1 1/16" cotton	lb.	.23 @
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.25 @
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.21 @
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.20 @
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.20 @
23/5/3 Karded peeler, 1¼" cotton	lb.	.28 @
23/5/3 Karded Egyptian, Egyptian uppers cotton	lb.	.35 @
23/5/3 Combed Egyptian.	lb.	.41 @

LENO BREAKER

8¼ oz. and 10¼ oz. 60" Karded peeler	lb.	.23 @

Imports, Consumption, and Stocks



United States Stocks, Imports, and Consumption

AUGUST consumption of crude rubber by domestic rubber manufacturers is estimated at 27,586 long tons, a decrease of 4,351 tons from the recorded consumption for July.

Imports of crude for August amounted to 38,370 tons, or 2,634 tons less than July imports. August imports exceeded August consumption by 10,784 tons.

Crude rubber afloat to the United States on August 31 was 61,469 tons, or 5,404 tons less than was afloat on July 31. Despite the record low prices for crude, shipments of rubber to the United States have maintained abnormally high tonnages thus far this year.

Stocks on hand in the United States August 31 were 240,817 tons. The world's rubber stock on July 31 was 420,750 long tons.

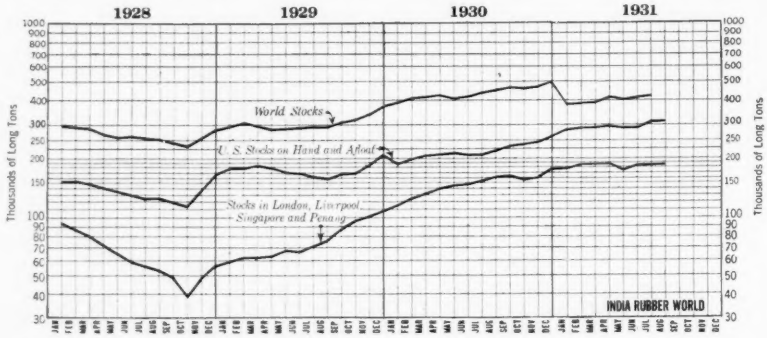
London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Aug. 29	81,575	55,609
Sept. 5	81,011	55,239
Sept. 12	81,011	54,791
Sept. 19	81,048	55,024

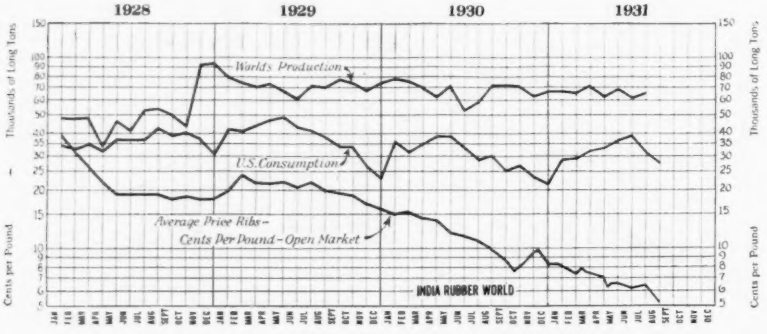
Native Production

While natives in Malaya show more signs of curtailing rubber outputs than estates thus far, native producers are showing unexpected tenacity during 1931, and changes in the present situation seem likely to be achieved only slowly. The most favorable factor pointing to a permanent limitation of native output is a current general tendency for natives to turn from planting rubber to the production of other crops.

Finding it difficult to support himself on rubber, the native is turning to food crops, which should make him reduce output when prices are low, but would not prevent increasing that output should prices rise materially. Another factor affecting this situation is the reduction in living costs, which tends to maintain native production even at low prices.



World, United States, London, Liverpool, Singapore and Penang Stocks



World's Production, U. S. Consumption, and Price of Ribs

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang Stocks, Etc.†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks U. S. A., U. K., Singapore, and Penang†‡ Tons
1925	384,837	384,644	50,985	52,421	6,328	18,840	527,600	553,300	180,850
1926	411,962	358,415	72,510	51,238	51,320	26,443	621,900	542,000	273,060
1927	431,807	372,528	100,130	47,938	66,261	25,798	607,300	593,866	298,780
1928	446,421	442,227	66,166	68,764	22,603	32,905	653,837	686,945	284,198
1929	561,454	466,475	105,138	62,389	73,253	35,548	860,404	804,820	371,425
1930	488,343	375,980	200,998	56,035	120,575	46,003	815,835	702,935	492,165
1931									
January	37,098	28,557	209,487	56,188	124,336	48,306	65,714	49,620	382,129
February	36,645	28,797	212,834	63,680	126,874	48,164	65,719	59,970	387,872
March	40,338	32,788	218,317	63,133	133,013	48,300	71,218	59,980	399,630
April	46,648	33,321	228,383	56,700	138,144	44,857	63,395	51,200	411,384
May	31,720	37,817	220,799	73,564	138,945	43,212	68,628	63,190	402,936
June	45,776	37,916	225,536	69,421	136,233	46,573	62,090	64,050	409,132
July	41,004	31,937	234,822	66,873	135,916	50,021	66,600	58,240	420,759
August	38,370	27,586	240,817	61,469	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule.
†Stocks on hand the last of the month or year.
‡W. H. Rickinson & Son's 1931 figures.

Rubber Scrap

REVIVAL of interest in the rubber scrap market is no more apparent than one month ago. Reclaimers' stocks are ample for current production and for any likely increase in fall demand. Collections of all grades of rubber scrap have been fair all summer with the demand subnormal to the customary seasonal rate in conformity with the dullness of general business. Prices for all grades of rubber scrap are very low. In fact practically all of the active qualities have suffered reductions in the past three months.

New England Freight Association Proposal No. 23,203 proposes to establish a reduced rate of 10 cents per 100 pounds on scrap rubber, from New Canaan to Naugatuck, Conn.

BOOTS AND SHOES. The supply of scrap boots and shoes is ample and well maintained. The market quotations for all grades in this group have been steady and unchanged for the past two months.

INNER TUBES. Collections are light. Quotations are unchanged on No. 1 floating and red grades. No. 2 compounded and mixed tubes have declined ⅛ cent. The demand for red tubes is very good, also for No. 1 tubes, of which the supply is low. No. 2 tubes are in fair demand.

TIRES. All grades are fairly active, but collections are not heavy. Freight rates are such that stock cannot be moved economically but must be disposed of locally at very little margin of profit. Prices have declined on all grades except auto tire carcass and black auto peelings.

Solid tires, both light and heavy gravity, increased in supply the past month, and the price has fallen $1 per ton on each grade.

MECHANICALS. All grades are dull and are quoted unchanged except for a reduction of ⅛-cent a pound for both No. 1 red and No. 2 red.

HARD RUBBER. Prime quality is scarce and becoming extinct gradually. The price is quoted steady and unchanged.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills

September 26, 1931

		Prices
Boots and Shoes		
Boots and shoes, black	100 lb.	$0.875 @$1.00
Colored	100 lb.	.625 @ .75
Untrimmed arctics	100 lb.	.625 @ .75
Tennis shoes and soles	100 lb.	.50 @ .60
Inner Tubes		
No. 1, floating	lb.	.03¾ @ .04
No. 2, compound	lb.	.01¾ @ .02
Red	lb.	.01⅜ @ .01½
Mixed tubes	lb.	.01½ @ .01⅝
Tires		
Pneumatic Standard		
Mixed auto tires with beads	ton	9.00 @ 9.25
Beadless	ton	13.00 @13.25
Auto tire carcass	ton	12.00 @12.50
Black auto peelings	ton	19.50 @20.00
Solid		
Clean mixed truck	ton	21.50 @22.00
Light gravity	ton	30.00 @31.00
Mechanicals		
Mixed black scrap	lb.	.00⅝ @ .00¾
Hose, air brake	ton	8.00 @ 9.00
Garden, rubber covered	lb.	.00⅜ @ .00½
Steam and water, soft	lb.	.00⅜ @ .00½
No. 1 red	lb.	.01¾ @ .01⅞
No. 2 red	lb.	.01 @ .01⅛
White druggists' sundries	lb.	.01½ @ .01¾
Mechanical	lb.	.01 @ .01⅛
Hard Rubber		
No. 1 hard rubber	lb.	.08¾ @ .09

Unemployment and the Rubber Industry

THE Rubber Manufacturers Association, Inc., directors, 250 W. 57th St., New York, N. Y., have given the question of unemployment in the industry most earnest consideration. At a recent meeting the board unanimously adopted a recommendation to the industry that, in order to give employment to the greatest number of people, every effort be made by all rubber manufacturers to maintain the present forces, even if a reduction in hours becomes necessary; this policy to apply to all classes of employes.

Rubber manufacturers supporting this resolution include Goodyear Tire & Rubber Co., The B. F. Goodrich Co., Firestone Tire & Rubber Co., General Tire & Rubber Co., Seiberling Rubber Co., India Tire & Rubber Co., and Falls Rubber Co., all of Akron, O.

Office and salaried people of the Goodyear company will take two weeks vacation without pay between October 1 and February 1, as part of the plan to prevent lay-offs and to spread work among the largest number of people.

In announcing the plan, President P. W. Litchfield stated his belief that business recovery would be retarded as long as a great number of people were unemployed, and that finding work for men was necessary if the dole is to be avoided.

Mr. Litchfield made it clear that office people were not merely to lose two weeks' pay. They were to stay away during that period.

"It takes a certain number of man-hours to take care of business requirements," he explained. "The only way to provide more jobs is to shorten the number of man-hours put in by those who are now employed, releasing extra man-hours to prevent further lay-offs or provide additional employment for some now out of work."

Goodrich announced a 10 per cent reduction in hours of work for salaried employes, with a corresponding reduction in compensation.

W. S. Wolfe, an R. M. A. director as well as executive vice president and factory manager of the Seiberling company, in announcing that company's support of the R. M. A. resolution declared, "Every effort will be made to hold the present personnel. We will work shorter shifts and less days when necessary."

The India Tire & Rubber Co. stated: "India, which has maintained its 1929 salary and wage scales, has found its labor most receptive to shortened hours during slack times. Such a procedure was inaugurated in 1930 and will continue to be practiced through the coming winter, so there will be no reduction in personnel."

Although the Firestone and General companies also favor the R. M. A. resolution, no definite plans have been announced.

The United States Rubber Co. announced that beginning October 1 its entire organization will go on a five-day week as its normal working schedule. The change, which will affect every salaried employe, including the president and other officers, involves a 9 per cent reduction in salaries to conform to the reduction in working time. The corporation employs about 25,000 persons. President F. B. Davis, Jr., explained that the employes in its factories would be placed on a five-day week. Their present hourly wage scale would not be changed, but no employe would be allowed to work more than five days a week, regardless of the number of days the factory operates. He believes that as business improves, it will be possible to increase working forces.

Interesting Letters

Rumors of Davol Sale False

TO THE EDITOR: It has come to my attention on several occasions in the past and again today, that rumors are being circulated among our trade that the Davol Rubber Co. have sold out to someone or other. Various ones of the large interests being named at different times as the rumors are set afloat.

Inasmuch as this company has not been sold or any of its stock disposed of and that no negotiations of any character relating to such a sale are pending or contemplated, and that there is not the slightest particle of foundation for such rumors, I would esteem it a favor if you would publish the above as a formal denial of all such rumors, over my signature.

Hoping it may have the effect of quieting and nullifying any ill-effects that may have resulted from the above reports referred to which we cannot view in any other way or construe other than unfriendly propaganda, we remain,

DAVOL RUBBER CO.,
CHAS. J. DAVOL,
President and Treasurer.

Providence, R. I., September 11, 1931.

Russia

The Russian Association for the Rubber Industry plans to increase considerably the output of rubber goods during the second half of the current year. Whereas the value of the rubber goods produced in Russia during 1930 amounted to 301,000,000 rubles, and the program for 1931 provided for goods to be manufactured to a value of 363,000,000 rubles, the new program raises the amount to 440,000,000 rubles. The quantity of rubber shoes to be produced was at first assessed at 42,500,000 pairs, but has now been raised to 58,500,000 pairs. Increased manufacturing of such products as sanitary rubber goods, sporting goods, etc., also will take place.

Czechoslovakia

The Bata Co., Zlin, Czechoslovakia, is said to be equipping a plant to manufacture automobile tires.

Principal Rubber Stocks

Long Tons—1931

	Mar.	Apr.	May	June	July	Aug.
Malay Estates	22,492	21,406	21,901	22,101	23,116	.....
S. S. Dealers	44,317	41,456	40,069	42,066	42,649	42,393
Other Malay Dealers	17,735	15,697	15,270	16,647	17,261	.....
Malayan Ports	3,983	3,401	3,143	5,915	7,372	5,617
Totals	88,527	81,960	80,383	86,729	90,398	.....
London	84,736	86,982	86,726	83,071	81,317	*81,630
Liverpool	49,094	51,879	53,668	53,975	54,833	*55,600
Totals	133,830	138,861	140,394	137,046	136,150	*137,230
U. S. Inventory	215,523	224,211	219,405	225,346	235,746	.....
U. S. Afloat	63,133	56,700	73,564	69,421	66,873	61,469
Europe Afloat	21,990	18,500	17,770	18,440	*23,800	*22,700
Totals	85,123	75,200	91,334	87,861	*90,673	*84,169
Grand totals	523,003	520,232	531,516	536,982	552,967	.....

*Estimate.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for August, 1931:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

August, 1931

To	Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	5,825	36
United States	27,634	73
Continent of Europe	4,868	28
British possessions	338	
Japan	3,541	
Other countries	489	
Totals	42,695	137

Rubber Imports

Actual Imports by Land and Sea

August, 1931

From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	514	3,957
Dutch Borneo	386	2,531
Java and other Dutch Islands	158	13
Sarawak	670	22
British Borneo	175	18
Burma	18	3
Siam	115	95
French Indo-China	298	12
Other countries	72	6
Totals	2,406	6,657

Low and High New York Spot Prices

Plantations	1931*	September 1930	1929
Thin latex crepe	$0.05¼ @ $0.05¾	$0.07¾ @ $0.10⅛	$0.20⅝ @ $0.21⅜
Smoked sheet, ribbed	.04⅞ @ .05⅜	.07½ @ .09¾	.19⅝ @ .20½
Paras			
Upriver fine	.06 @ .07¼	.12 @ .13¾	.19¾ @ .21¾
Upriver coarse	Nominal	.06½ @ ...	.11 @ .11½
Upper caucho ball	.03 @ ...	.06 @ ...	.11 @ .11½

*Figured to September 25, 1931.

London Stocks, July, 1931

London	Landed Tons	Delivered Tons	Stocks July 31 1931 Tons	1930 Tons	1929 Tons
Plantation	4,111	5,870	81,241	80,144	30,875
Other grades	52	42	44	54	76
Liverpool					
Plantation	*2,836	*1,978	*54,833	*27,332	*4,550
Total tons, London and Liverpool	6,999	7,890	136,118	107,530	35,501

*Official returns from the recognized public warehouses.

World Rubber Absorption—Net Imports

Long Tons

Consumption	Calendar Years 1929	1930	1931 May	June	July
United States	472,000	376,107	38,149	38,249	32,217
United Kingdom	72,023	74,760	5,679	8,957	6,262
Net Imports					
Australia	15,886	5,354	884	1,112	627
Austria	3,324	2,365	299	143	322
Belgium	9,445	10,740	1,153	1,058	.....
Canada	35,453	28,793	2,748	2,112	2,592
Czechoslovakia	4,650	4,532	711	607	.....
Denmark	799	1,147	107	61	69
Finland	976	1,262	29	49	78
France	59,342	68,503	2,880	4,002	3,301
Germany	49,078	45,488	3,231	3,504	3,226
Italy	17,169	18,570	1,023	1,462	809
Japan	34,284	32,731	3,755	2,988	.....
Netherlands	3,022	2,924	86	272	41
Norway	813	1,143	88	82	64
Russia	12,626	16,229	1,034	3,279	.....
Spain	2,400	2,400	180	207	145
Sweden	3,857	4,414	271	385	218
Switzerland	653	808	60	53	63
Others estimated†	7,000	7,200	*600	*600	*600
Totals	804,800	705,470	62,967	68,182	.....
Minus United States (Cons.)	472,000	376,107	38,149	38,249	32,217
Total foreign	332,800	329,363	24,818	30,933	.....

*Estimate to complete table. †Includes Argentina, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, and Union of South Africa.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Tire Production Statistics

Pneumatic Casings—All Types

	Inventory	Production	Total Shipments
1928	10,217,708	58,457,873	55,721,937
1929	9,470,368	54,980,672	55,515,884
1930	7,202,750	40,772,378	42,913,108
1931			
January	7,165,846	2,939,702	2,995,479
February	7,628,520	3,188,274	2,721,347
March	8,011,592	3,730,061	3,297,225
April	8,025,135	3,955,491	3,945,525
May	8,249,856	4,543,003	4,332,137
June	8,357,768	4,537,970	4,457,509
July	7,935,565	3,941,187	4,369,526

Inner Tubes—All Types

	Inventory	Production	Total Shipments
1928	12,087,464	60,131,381	57,845,189
1929	10,245,365	55,062,886	56,473,303
1930	7,999,477	41,936,029	43,952,139
1931			
January	7,551,503	2,898,405	3,249,734
February	7,936,773	3,132,770	2,720,135
March	8,379,974	3,559,644	3,031,279
April	8,330,155	3,693,222	3,708,949
May	8,438,799	4,329,731	4,224,594
June	8,403,401	4,286,467	4,317,543
July	7,671,801	3,964,174	4,664,964

Solid and Cushion Tires

	Inventory	Production	Total Shipments
1928	152,120	508,223	512,602
1929	122,200	407,347	436,027
1930	75,871	204,340	250,635
1931			
January	75,205	12,631	13,072
February	73,338	11,358	12,915
March	68,584	11,424	16,152
April	64,369	11,610	15,445
May	61,272	11,369	15,566
June	57,462	11,764	15,364
July	54,692	13,370	16,051

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1928	222,243,398	600,423,401	13,633,452,000
1929	208,824,653	598,994,708	14,748,552,000
1930	158,812,462	476,755,707	16,200,894,000
1931			
January	12,738,467	36,318,980	1,127,532,000
February	12,002,161	36,651,119	1,097,208,000
March	14,040,803	41,850,638	1,303,302,000
April	15,243,625	45,016,344	1,402,800,000
May	18,009,764	53,417,709	1,499,904,000
June	17,084,749	51,279,827	1,611,540,000
July	15,139,769	46,696,925	1,657,446,000

Rubber Manufacturers Association figures representing 80 per cent of the industry since January, 1929, with the exception of gasoline consumption.

United States Statistics

Imports of Crude and Manufactured Rubber

	June, 1931 Pounds	June, 1931 Value	Six Months Ended June, 1931 Pounds	Six Months Ended June, 1931 Value
UNMANUFACTURED—*Free*				
Crude rubber	103,561,554	$6,918,900	530,883,263	$41,630,544
Liquid latex	1,581,394	129,496	5,487,946	521,028
Jelutong or pontianak	1,525,621	123,616	6,836,656	600,811
Balata	549,202	79,786	1,596,122	262,334
Gutta percha	....	.....	176,636	19,752
Guayule	.....	.....	.....	.....
Siak, scrap, and reclaimed	760,497	5,617	4,667,416	48,144
Totals	107,978,268	$7,257,415	549,648,039	$43,082,613
Chicle *Dutiable*	.....	.....	.....	.....
Chicle, crude *Free*	1,787,841	$781,744	5,672,970	$2,686,537
MANUFACTURED—*Dutiable*				
Tires *number*	3,355	$14,012	12,414	$42,763
Other rubber manufactures	.....	78,750	.....	448,036
Totals	.....	$92,762	.....	$490,799

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	7,189,009	$520,403	33,226,867	$2,742,006
Balata	4,757	1,129	73,498	20,189
Guayule	.....	.....	24,700	3,575
Gutta percha, rubber substitutes, and scrap	4,847	811	10,122	1,802
Rubber manufactures	.....	399	.....	4,697
Totals	.....	$522,742	.....	$2,772,269

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,576,092	$70,767	9,199,520	$441,925
Scrap and old	4,039,212	93,111	24,278,091	602,118
Rubberized automobile cloth, *sq. yd.*	84,549	35,860	490,629	222,274
Other rubberized piece goods and hospital sheetings *sq. yd.*	139,598	54,931	634,716	264,853
Footwear				
Boots *pairs*	34,230	84,583	201,261	495,482
Shoes *pairs*	28,983	21,777	406,881	278,547
Canvas shoes with rubber soles *pairs*	173,698	105,828	1,062,865	676,831
Soles *doz. pairs*	9,908	25,519	43,199	114,571
Heels *doz. pairs*	70,624	43,170	420,761	281,221
Water bottles and fountain syringes *number*	27,617	11,803	156,177	69,100
Gloves *doz. pairs*	7,495	16,811	47,760	121,442
Other druggists' sundries	.....	31,678	.....	170,835
Balloons *gross*	43,834	41,698	318,101	287,106
Toys and balls	.....	11,494	.....	63,130
Bathing caps *doz.*	6,194	14,900	97,869	191,528
Bands	32,167	10,578	255,514	97,366
Erasers	42,673	25,506	234,628	139,763
Hard rubber goods				
Electrical goods	63,074	8,107	689,012	76,927
Other goods	.....	15,644	.....	126,593
Tires				
Truck and bus casings, *number*	35,367	693,512	223,269	4,609,441
Other automobile casings, *number*	129,246	960,639	808,189	6,114,773
Tubes, auto *number*	106,758	133,124	652,903	898,253
Other casings and tubes, *number*	7,775	13,443	52,659	103,363
Solid tires for automobiles and motor trucks *number*	887	31,174	6,339	207,820
Other solid tires	237,572	27,904	857,488	120,025
Tire sundries and repair materials	.....	69,052	.....	435,670
Rubber and friction tape	101,397	25,796	615,137	171,831
Belting	337,818	134,788	1,754,787	787,716
Hose	415,836	132,842	2,719,812	807,328
Packing	113,951	42,464	730,489	300,320
Thread	150,640	107,222	842,388	736,449
Other rubber manufactures	.....	141,445	.....	918,964
Totals	.....	$3,237,170	.....	$20,933,565

Crude Rubber Imports by Customs Districts

Including latex, dry rubber content

	July, 1931 Pounds	July, 1931 Value	July, 1930 Pounds	July, 1930 Value
Massachusetts	4,201,073	$316,647	1,975,928	$266,772
New York	78,179,278	4,932,962	65,676,697	8,844,708
Philadelphia	1,295,862	71,907	51,798	6,621
Maryland	4,053,148	202,492	1,804,014	215,542
Georgia	431,292	20,286	1,590,480	241,008
Mobile	1,120,000	61,269	.....	.....
Los Angeles	9,179,954	507,865	7,338,125	941,318
San Francisco	47,040	3,161	132,942	18,975
Indiana	168,000	12,027	.....	.....
Ohio	.....	.....	444,218	54,817
Colorado	.....	.....	336,000	42,871
Totals	98,675,647	$6,128,616	79,350,202	$10,632,632

United Kingdom Statistics

Imports

	July, 1931 Pounds	July, 1931 Value	Seven Months Ended July, 1931 Pounds	Seven Months Ended July, 1931 Value
UNMANUFACTURED				
Crude Rubber From				
Straits Settlements	8,629,600	£117,205	91,121,900	£1,387,590
Federated Malay States	4,109,500	57,865	40,875,600	663,117
British India	1,578,200	21,045	8,624,700	133,838
Ceylon and Dependencies	1,899,300	25,482	16,662,300	263,438
Java and Dutch Borneo	2,278,700	31,388	18,340,700	287,014
Sumatra and other Dutch possessions in Indian Seas	922,700	12,145	10,754,900	173,665
Other countries in East Indies and Pacific, not elsewhere specified	156,900	2,081	2,329,600	38,010
Brazil	284,100	4,105	3,190,300	63,579
South and Central America (except Brazil)	.....	.....	42,400	595
West Africa				
French West and Equatorial Africa	4,400	62	25,400	444
Gold Coast	.....	.....	175,500	2,666
Other parts of West Africa	123,700	1,856	1,150,900	19,007
East Africa, including Madagascar	20,200	262	174,900	2,849
Other countries	91,300	1,822	614,700	12,529
Totals	20,098,600	£275,318	194,083,800	£3,048,341
Gutta percha and balata	288,100	14,290	1,948,800	133,473
Waste and reclaimed rubber	527,000	4,772	4,774,800	44,405
Rubber substitutes, synthetic	3,800	124	11,700	324
Totals	20,917,500	£294,504	200,819,100	£3,226,543
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£18,717	.....	£122,532
Inner tubes	.....	5,693	.....	37,268
Solid tires	.....	4,573	.....	21,466
Boots and shoes *doz. pairs*	69,956	103,605	812,488	873,940
Other rubber manufactures	.....	145,342	.....	1,039,882
Totals	.....	£277,930	.....	£2,095,088

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,267,800	£7,287	8,414,900	£53,551
Rubber substitutes, synthetic	27,600	465	261,600	4,966
Totals	1,295,400	£7,752	8,676,500	£58,517
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£267,124	.....	£1,784,364
Inner tubes	.....	34,070	.....	219,120
Solid tires	.....	5,895	.....	33,693
Boots and shoes *doz. pairs*	16,470	20,312	113,910	140,573
Other rubber manufactures	.....	181,016	.....	1,219,261
Totals	.....	£508,417	.....	£3,397,011

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude Rubber To				
Soviet Union (Russia)	3,840,400	£61,635	17,736,200	£446,117
Sweden, Norway, and Denmark	131,300	2,665	1,392,500	27,634
Germany	2,065,700	31,232	11,499,400	192,956
Belgium	562,500	9,501	6,552,900	109,288
France	798,500	13,008	10,094,100	189,920
Spain	73,600	2,135	742,000	19,910
Italy	235,300	3,406	2,669,500	43,719
Other European countries	169,800	3,488	2,027,800	49,513
United States	12,500	204	1,645,100	39,152
Other countries	189,700	3,179	967,500	24,410
Totals	8,079,300	£130,453	55,327,000	£1,142,619
Gutta percha and balata	54,100	3,452	346,400	32,131
Waste and reclaimed rubber	26,400	320	148,500	2,084
Rubber substitutes, synthetic	.....	.....	1,400	18
Totals	8,159,800	£134,225	55,823,300	£1,176,852
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£5,004	.....	£53,004
Inner tubes	.....	201	.....	2,850
Solid tires	.....	.....	.....	215
Boots and shoes *doz. pairs*	3,713	3,338	18,408	20,546
Other rubber manufactures	.....	4,641	.....	34,494
Totals	.....	£13,184	.....	£111,109

*Motor cars, motorcycles, parts, and accessories were liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and tires and tubes until Apr. 11, 1927, inclusive.

AUGUST EXPORTS OF CRUDE RUBBER FROM THE AMAZON VALLEY WERE 856 long tons (139 to United States, 659 to Europe, and 58 to Brazil); stocks August 31, 2,897 tons Para, 1,674 tons Manaos.

United States Crude and Waste Rubber Imports for 1931 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Totals 1931	Totals 1930	Balata	Miscellaneous	Waste
January ..... tons	36,525	206	331	36	..	..	..	37,098	47,362	65	960	38
February	35,749	339	516	40	1	..	..	36,645	43,728	1	580	..
March	38,922	352	1,062	2	..	..	..	40,338	45,430	170	800	..
April	46,034	323	291	..	..	..	..	46,648	49,927	196	908	60
May	30,962	248	508	2	..	..	..	31,720	40,745	78	450	2
June	44,495	601	640	40	..	..	..	45,776	42,653	271	892	6
July	40,477	316	211	..	..	..	..	41,004	34,084	131	519	6
August	37,920	328	121	1	..	..	..	38,370	34,558	82	375	13
Total, eight months, 1931 ..... tons	311,084	2,713	3,680	121	1	..	..	317,599	..	994	5,484	125
Total, eight months, 1930 ..... tons	329,297	2,720	5,167	294	187	822	..	.....	338,487	846	5,869	436

Compiled from Rubber Manufacturers Association statistics.

Plantation Rubber Crop Returns by Months

Summary of 615 Producing Companies

	Br. N. Borneo (26 Companies)		Ceylon (102 Companies)		India and Burma (21 Companies)		Malaya (338 Companies)		Netherlands East Indies — Java (60 Companies)		Netherlands East Indies — Sumatra (60 Companies)		Miscellaneous (8 Companies)		Total (615 Companies)	
	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index
1931																
January	473	96.7	1,776	87.0	397	70.6	13,006	104.6	3,020	115.0	4,324	107.2	225	124.3	23,221	99.8
February	365	74.6	1,138	55.8	160	28.5	11,551	92.9	2,631	100.2	3,721	92.3	130	71.8	19,696	84.7
March	378	77.3	1,065	52.2	510	90.7	11,439	92.0	3,174	120.9	4,173	103.5	182	100.6	20,921	89.9
April	351	71.8	1,699	83.2	672	119.6	10,423	83.8	3,069	116.9	3,726	92.4	208	114.9	20,148	86.6
May	432	88.3	1,365	66.9	655	116.5	11,737	94.4	3,235	123.2	4,075	101.1	214	118.2	21,713	93.3
June	412	84.3	904	44.3	232	41.3	11,782	94.8	3,043	115.9	4,255	105.5	212	117.1	20,840	89.6
July	414	84.7	1,265	62.0	214	38.1	13,238	106.5	3,086	117.5	4,512	111.9	218	120.4	22,947	98.6
August	427	87.3	1,151	56.4	115	20.5	13,143	105.7	2,356	89.7	4,604	114.2	213	117.7	22,009	94.6
Eight months ending August 1931	3,252	....	10,363	....	2,955	....	96,319	....	23,614	....	33,390	....	1,602	....	171,495	....

NOTE. Index figures throughout are based on the monthly average for 1929=100. Issued September 11, 1931, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Rubber Goods Production Statistics

		1931						1930					
	July	June	May	Apr.	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Aug.	July
TIRES AND TUBES													
Pneumatic casings													
Production ..... thousands	....	4,538	4,543	3,955	3,730	3,188	2,940	2,251	2,123	2,866	2,692	3,332	3,193
Shipments													
Domestic ..... thousands	....	4,320	4,197	3,804	3,143	2,580	2,855	2,550	2,119	2,613	3,360	3,976	4,229
Exports ..... thousands	....	137	135	142	155	142	140	139	148	186	165	164	129
Stocks, end of month ..... thousands	....	8,358	8,250	8,025	8,012	7,629	7,166	7,203	7,676	7,842	7,849	8,678	9,449
Solid and cushion tires													
Production ..... thousands	....	12	11	12	11	11	13	13	13	18	14	16	13
Shipments													
Domestic ..... thousands	....	14	14	14	15	12	12	12	13	19	22	22	19
Exports ..... thousands	....	1	1	1	1	1	1	1	1	1	1	1	1
Stocks, end of month ..... thousands	....	57	61	64	69	73	75	76	76	78	82	90	101
Inner tubes													
Production ..... thousands	....	4,286	4,330	3,693	3,560	3,133	2,898	2,448	2,144	3,161	3,053	3,837	3,151
Shipments													
Domestic ..... thousands	....	4,228	4,135	3,610	2,922	2,619	3,147	2,634	2,147	2,659	3,525	4,492	4,594
Exports ..... thousands	....	89	89	99	109	101	102	96	84	119	108	118	90
Stocks, end of month ..... thousands	....	8,403	8,439	8,330	8,380	7,937	7,552	7,999	8,250	8,414	8,052	8,589	9,326
Raw material consumed													
Fabrics ..... thous. of lbs.	....	17,085	18,010	15,244	14,041	12,002	12,738	8,358	8,418	11,780	10,917	13,223	13,399
Crude rubber ..... thous. of lbs.	....	51,280	53,418	45,016	41,851	36,651	36,319	25,537	26,253	36,097	33,382	40,736	39,365
MISCELLANEOUS RUBBER PRODUCTS													
Mechanical rubber goods, shipments													
Belting ..... thous. of dollars	....	798	790	832	889	722	759	675	779	954	1,045	1,248	1,364
Hose ..... thous. of dollars	....	1,650	1,857	2,129	1,892	1,611	1,440	1,337	1,276	1,554	1,473	1,682	1,856
All other ..... thous. of dollars	....	1,431	1,584	1,656	1,631	1,378	1,400	1,326	1,345	1,678	1,565	1,622	1,690
Total ..... thous. of dollars	....	3,879	4,231	4,617	4,412	3,711	3,599	3,338	3,400	4,186	4,083	4,552	4,910
Rubber and canvas footwear													
Tennis													
Production ..... thous. of pairs	....	1,999	2,142	2,591	2,609	2,492	2,409	1,875	1,940	1,821	1,445	1,672	1,630
Shipments, domestic .... thous. of pairs	....	2,657	4,372	3,624	2,879	2,343	2,318	871	319	562	1,441	1,389	1,662
Exports ..... thous. of pairs	....	100	121	150	236	200	110	175	148	263	340	238	250
Stocks ..... thous. of pairs	....	6,766	7,523	9,889	10,960	11,451	11,506	10,633	10,712	9,239	8,248	8,597	8,563
Waterproof, total													
Production ..... thous. of pairs	....	1,922	1,261	1,102	874	958	1,272	2,214	2,736	2,960	2,822	2,616	1,976
Shipments, domestic .... thous. of pairs	....	1,173	626	1,070	944	1,015	1,549	3,888	4,212	5,299	4,968	3,430	2,020
Exports ..... thous. of pairs	....	108	50	72	53	92	74	63	135	287	548	384	313
Stocks ..... thous. of pairs	....	16,763	16,357	15,733	15,803	16,030	16,179	17,172	18,449	20,054	22,680	25,416	26,617
Grand total													
Production ..... thous. of pairs	....	3,921	3,402	3,693	3,483	3,450	3,681	4,089	4,675	4,781	4,267	4,288	3,606
Shipments, domestic .... thous. of pairs	....	3,830	4,998	4,694	3,822	3,358	3,867	4,759	4,531	5,861	6,409	4,820	3,682
Exports ..... thous. of pairs	....	208	171	222	288	292	184	237	282	550	898	622	563
Stocks ..... thous. of pairs	....	23,528	23,881	25,622	26,762	27,481	27,685	28,806	29,160	29,293	30,928	34,013	35,181
Rubber heels													
Production ..... thous. of pairs	....	17,093	15,474	15,408	14,661	13,156	12,973	13,101	11,083	16,460	14,322	13,735	15,117
Shipments													
Exports ..... thous. of pairs	....	630	612	578	577	658	748	838	880	966	1,083	780	938
Repair trade ..... thous. of pairs	....	4,946	3,975	4,038	4,868	4,854	3,939	3,450	4,473	8,291	6,681	6,622	5,053
Shoe manufacturers ..... thous. of pairs	....	10,522	9,693	10,112	10,991	8,397	8,471	6,618	4,578	9,354	9,244	8,813	11,668
Stocks end of month ..... thous. of pairs	....	27,898	28,491	27,764	26,708	29,335	30,302	29,741	29,130	29,353	31,601	33,226	36,220
Rubber-proofed fabrics, production													
Auto fabrics ..... thous. of yds.	....	701	982	710	738	644	577	476	532	915	733	678	608
Raincoat fabrics ..... thous. of yds.	1,843	1,355	1,066	1,040	863	567	738	697	1,426	3,040	3,249	1,805	1,415
All other ..... thous. of yds.	963	1,156	1,002	1,271	1,168	973	891	736	864	1,254	1,064	975	917
Total ..... thous. of yds.	....	3,212	3,050	3,381	2,769	2,184	2,206	1,909	2,822	5,209	5,046	3,458	2,940
Rubber soles													
Production ..... thous.of pairs	....	3,177	2,885	2,692	2,292	2,724	2,481	3,021	1,426	3,056	2,193	1,473	2,663
Shipments													
Exports ..... thous. of pairs	....	59	62	69	14	36	11	58	60	82	74	74	34
Repair trade ..... thous. of pairs	....	225	330	255	408	290	287	243	280	492	333	317	364
Shoe manufacturers ..... thous. of pairs	....	2,899	2,651	2,474	2,145	2,259	2,090	2,305	1,011	2,638	1,691	1,161	2,627
Stocks, end of month ..... thous. of pairs	....	2,641	2,655	2,764	2,876	3,167	3,032	2,917	2,390	2,520	2,729	2,289	2,876

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.